

ProECU Programming Kit

User Guide – Subaru ALL Models

Introduction

Congratulations on your purchase of an EcuTek ProECU Programming Kit through MRT Performance (or one of our authorised resellers).

Within your ProECU Kit you will find the following components:

- 1x USB to OBDII communications cable
- 1x USB DESkey dongle

If you suspect you are missing any components please contact us.

You can use this kit for a variety of purposes including diagnostics, basic vehicle tools for selected vehicle types, programming of tuned ECU files and more. No software CD or DVD or vehicle files are supplied with the kit. All required software is downloadable from the EcuTek website as needed depending on your selected configuration. If you have acquired a kit to program your engine management system, some additional information will be required from you before we can send you the tuned file to load into your car. Please refer to the specific section below as needed.

Please note that this kit is designed solely for use with EcuTek software, use with any other form of software will NOT work, and WILL void any and all warranty.



Vehicle Compatibility

Depending on the configuration requested, the ProECU Programming kit allows access to over 1500 vehicle variants from supported manufacturer models including:

- Subaru – BRZ, Impreza, Forester, Outback and Legacy/Liberty (petrol and diesel models)
- Mitsubishi – EVOX/Ralliart, Challenger, Triton, Shogun and Pajero
- Mazda – MPS3, MPS6, CX7 (all 2.3L DISI variants) and MX5
- Nissan – GTR R35, Pulsar SSS/ST-L and Juke
- Toyota – All 86 variants (FT86, GT86 and Scion FR-S)
- Great Wall - Steed, Wingle and V200 (all TDi variants)

The full range of vehicles currently supported by EcuTek ProECU as well as a comprehensive feature set can be seen on the EcuTek website at www.ecutek.com.

Making The Most Of This User Guide

Due to the wide range of compatibility that the kit offers, this user guide has been set out with a view to you getting up and running and accessing your individual vehicle as quickly and easily as possible. While there are over 1500 compatible vehicle variants supported, you are probably only interested in 1 - yours!

With that in mind, there are 3 primary things you need to do to get started:

- Read the introduction (page 1) and make sure your kit contents are complete.
- Follow the Software and Driver Installation instructions (page 3).
- Check the vehicle list in the Index below and turn to those covering your specific vehicle.

In all cases, all communication with your vehicle occurs via the standard On Board Diagnostics (referred to as OBD2) port. Typically this is located in the drivers footwell in over 95% of applications.

There is absolutely no reason for you to remove the Engine Management System (ECU) from the vehicle, and no cutting or wiring work involved. You only need the supplied kit, a Windows based laptop, some basic knowledge on how to use it and this guide.



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Software And Driver Installation

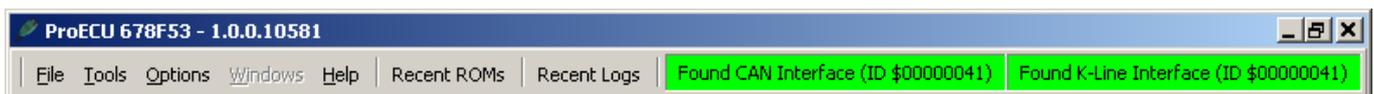
First and foremost, follow the EcuTek quick setup insert included in your kit – basically you need to do the following:

- Turn on your laptop and ensure you have a good high speed internet connection (and not suffering from drop outs or poor download speeds if on a mobile broadband setup).
- Go to www.ecutek.com/downloads.
- Click on the EcuTek App Downloader tab and then click the highlighted **EcuTek App Downloader** link.
- A new window will launch. Click on Install Drivers and follow the onscreen instructions.
- Plug in your supplied EcuTek mini USB Licence Key (NOT the cable, the small USB key).
- Click on Install EcuTek App Downloader and follow the onscreen instructions.

If you have followed the instructions correctly, all required software and drivers should download automatically. The end result will be that you have two shortcuts on your desktop - the first will be EcuTek AppDownloader (for downloading software updates or licence file updates), and the primary software application you will be using (ProECU).

At the end of the download process, ProECU should launch automatically. If it DOESN'T, then you more than likely have had an issue during the download/installation process (eg your internet connection has dropped out and ProECU hasn't downloaded properly or similar). If this is the case then you will need to recommence the software download process within Ecutek App Downloader.

The version of ProECU that EcuTek AppDownloader will retrieve is coded specifically to your mini USB Dongle Key. You will see a 6 digit code in the shortcut on your desktop, and in the main title bar of the software. This code is needed for ordering licence updates or if you have issues and require software technical assistance from us.



Note also the two green bars saying "Found CAN Interface" and "Found K-Line Interface". If you have downloaded and installed the drivers correctly, these will both be green when your USB to OBD2 vehicle interface cable is connected to your laptop (and red when disconnected).



If you have the vehicle interface plugged into your laptop and the two bars are RED, then you have a driver installation issue and will not be able to communicate with the vehicle. Run AppDownloader again to rectify the problem and if that fails, please contact your reseller.

It generally isn't required if the above is followed, however a full guide on software and driver installation (and trouble shooting) for both Windows XP and Windows 7 can be found at www.ecutek.com/downloads under the Download Hardware Drivers tab. Additionally further help files are available from the Help menu within the downloaded ProECU software if required.



Vehicles Covered

All Subaru petrol turbo models (both 2.0L and 2.5L) running Drive By Wire throttle from around 2004 through to approximately 2007 (when CAN based ECU models took over - refer next section covering the later model cars).

Cars in this range include:

- Subaru Liberty GT MY04-06 2.0L
- Subaru Forester XT MY04-06 2.5L
- Subaru Impreza WRX MY06-07 2.5L
- Subaru Impreza STi MY06-07 2.5L

Fuel Notes

All models are (unless otherwise requested!) tuned for 98 RON premium unleaded fuel Tuning to suit 95 RON (and in the case of some models with additional supporting modifications, E-85) is also available on special request. Please note, it is imperative that you have your car tuned for the fuel you plan on running it on...in other words, don't request a tune for 98 RON and then run it on 95 RON most of the time as engine damage is a potential likely outcome.

Engine Notes

- 12-14 PSi = Standard Boost (depending on model)
- 17 PSi = Maximum Recommend Boost (on both 2.0L and 2.5L models due to engine internal strength, specifically pistons)

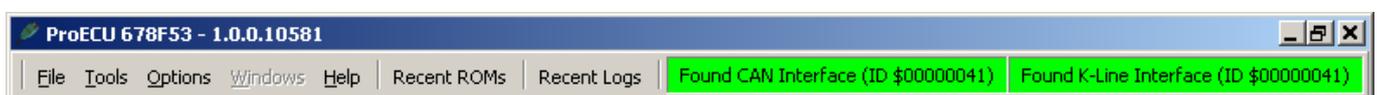
Recommended Modifications

We have completed extensive testing and development on all models within the supported range with everything from exhausts and intakes through to larger turbo fitment with modified fuel systems covered. Please refer to the specific power kit document covering your vehicle for further information.

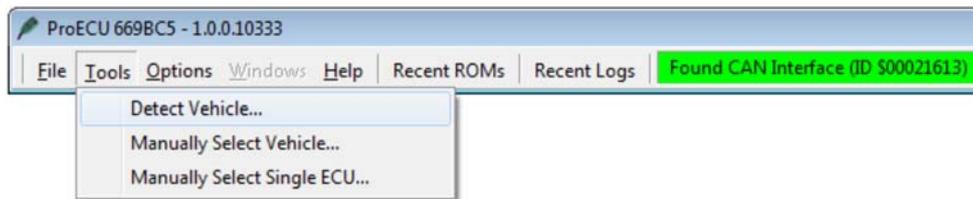
Establishing Communications And Determining ECU ROM ID

Once you have your software and vehicle interface drivers setup and everything functioning correctly, you are ready to connect to the OBD2 port on the car.

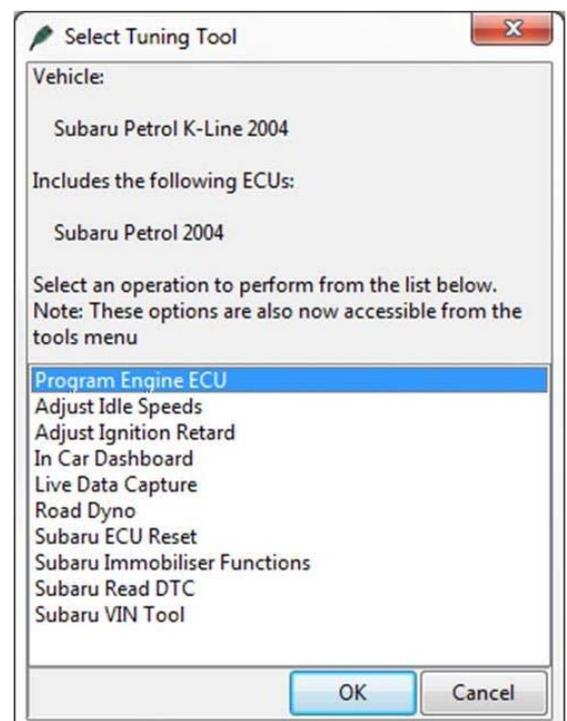
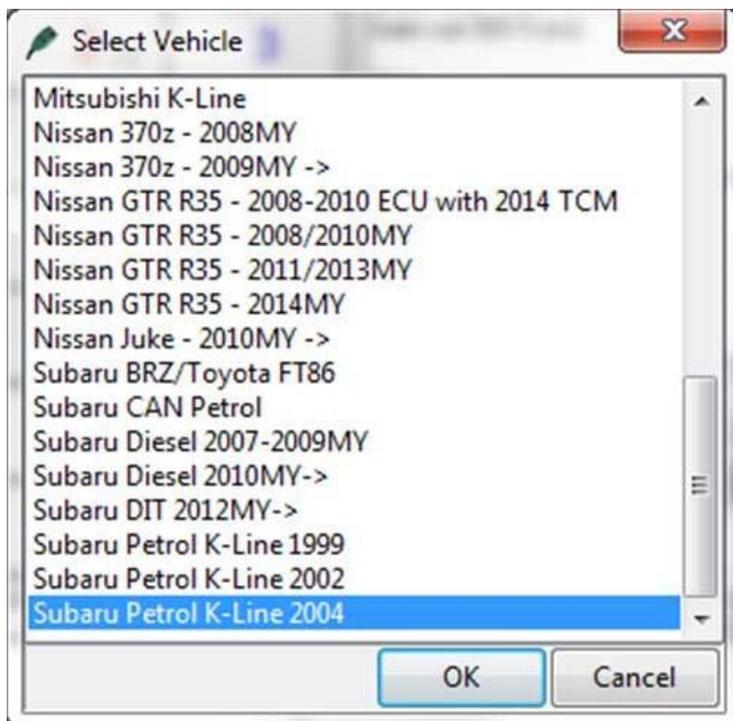
Plug in your USB mini dongle (the software won't open without it), then plug the USB connection into your laptop, and only THEN plug the OBD2 connector into your vehicle. Recall from the initial setup instructions that when your ProECU software is open and the USB vehicle interface is plugged into the PC, you should have green background colour on the title bar. If not, you have software issues that need rectification before you go any further:



Locate the OBD2 port either on the lower part of the trim piece towards the base of the steering column (Impreza and Forester XT models) or the foot well just above accelerator pedal (Liberty GT). Once you have everything connected, go to the Tools Menu within ProECU and select "Manually Select Vehicle".

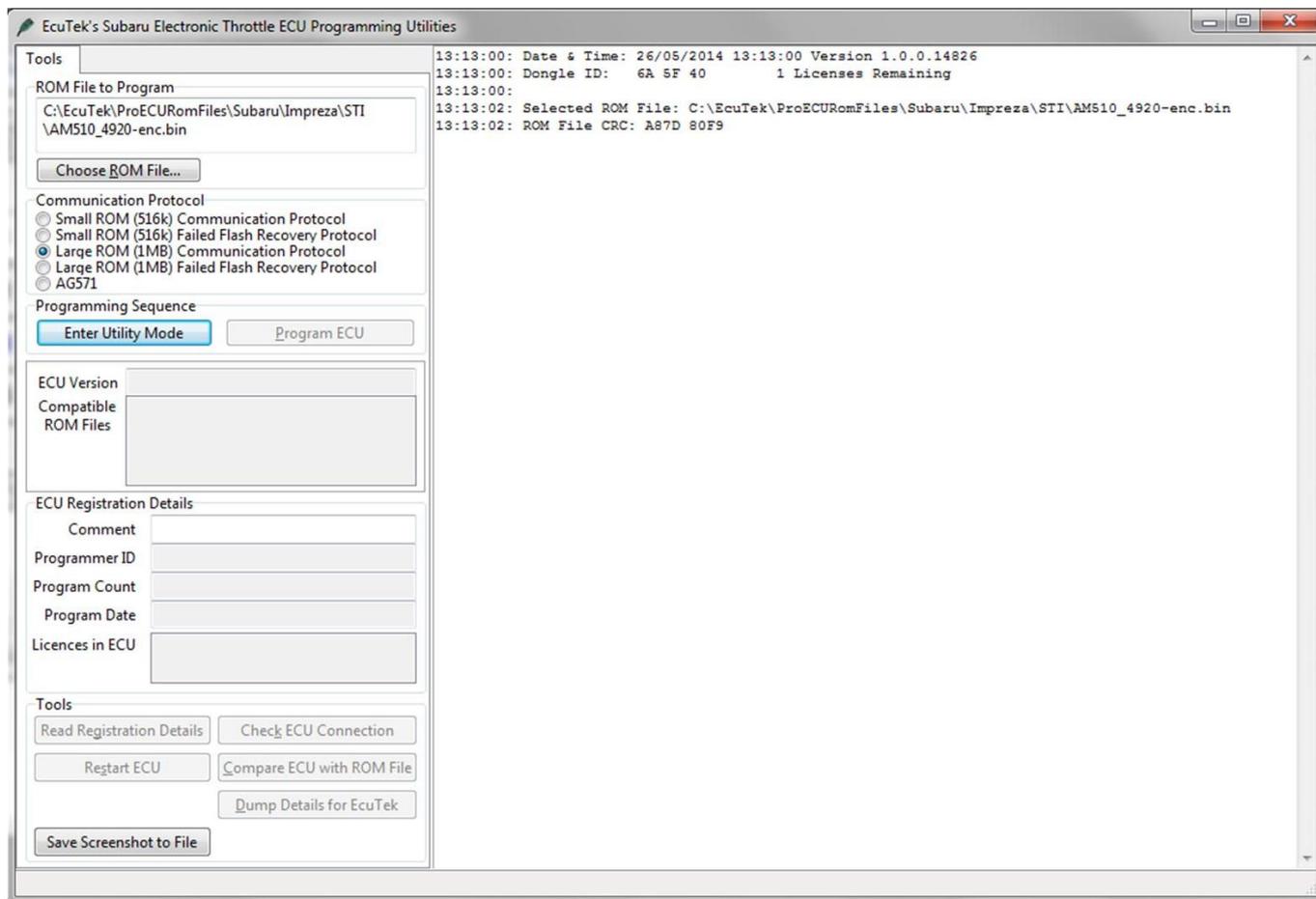


Scroll towards the bottom of the list and choose Subaru 2004 K-Line, which will bring up another list with a range of vehicle options. From this screen you can check/clear fault codes, reset the ECU and more (additional information on this a little later), however since you want to communicate with the ECU directly, select Program Engine ECU.



Programming Engine ECU

After selecting Program Engine ECU from the Tools Menu, you will get the following screen:



Before we can send you a compatible file for your car, we need to know what data file is contained within your ECU (otherwise known as a ROM file). Before proceeding, ensure that you have "Large ROM (1mb) Communication Protocol" selected (just under the Choose ROM File window at top left).

With earlier model ECU's, in order to establish communications with the ECU you must physically put the ECU into Test Mode prior to hitting "Enter Utility Mode". This is done by connecting two green connectors under the dash between the steering column and RH side trim (WRX, Forester and STi) or on passenger side floor above ECU just behind carpet top right of centre (Liberty GT). They are sometimes tucked away in the loom behind electrical tape, but they are always there as they are part of the OEM loom on all models.



If you have found and connected these correctly, when you turn the ignition on (but don't start the engine) the Check Engine Light on the dash will flash. At this point, hit "Enter Utility Mode" on the laptop and follow the directions on screen. To complete entry into Utility Mode you will need to leave the ign ON and disconnect the green connectors as directed.

Once you have successfully entered Utility Mode, data will be populated within the ECU Version and Compatible ROM windows (along with the present EcuTek Registration Details found within the ECU if programmed previously) on the left hand side of the window. At this point you'll see a button at the bottom of the window saying "Save Screenshot to File". Hit this button, and a message will come up advising a screenshot has been saved as a .PNG file to C:\EcuTek\ScreenShots directory on your laptop, and depending on your version of Windows, Windows File Explorer will open to that location when you hit ok on the message. Email this file to us at tuning@mrtperformance.com.au and give us a call to confirm that we have received it. If you are requiring a standard OEM ROM file for logging purposes or fault finding etc, then we'll be able to get something out to you via return email fairly quickly (typically inside an hour). If you are in need of a tuned file for your car that you can program the ECU with for increased performance, then we'll need a little more information in order to provide you with the most accurate tune for your requirements.

We will typically need to know:

- what fuel you are running the car on (eg diesel grade, or 95/98 RON if unleaded)
- if there are any existing modifications to the car (eg exhaust, intercooler, intake, etc)
- what you use the car for (eg heavy towing, performance use, etc)
- any other useful information that is out of the ordinary (eg you want optimum economy)

Tuned files, depending on your requirements and our workload, typically take 3-4 hours to prepare and get back to you via return email. Please note, contrary to common belief, requesting a file for a car that you have sitting on the dyno at 4:45pm on a Friday afternoon is NOT the most effective way of getting things done! In many cases, we will ask for a logged data file of a road test or dyno run to be saved and sent back to us to verify everything is running properly with the car after tuning. See the Data Logging section in Appendix for more information.

Please note, if you are wishing to program a tuned file into the car and it has NOT been programmed with EcuTek software previously, you will require a licence to do so. Please refer to the Appendix for further information on acquiring and loading a licence onto your hardware before proceeding.

Once you have a licence (if required) and the tuned file, it is simply a case of repeating the above instructions (assuming you closed the Programming Tools window and/or software while waiting for a ROM file to come back to you), selecting the file we have sent you in the "ROM File To Program" window at top left of screen and hitting the "Program ECU" button. Depending on file size, laptop speed, and ECU contents, programming can take between 30 seconds and 5 mins. On completion, ProECU will automatically clear all DTC's in various systems. Follow any additional instructions on screen to ensure this is completed correctly where required.

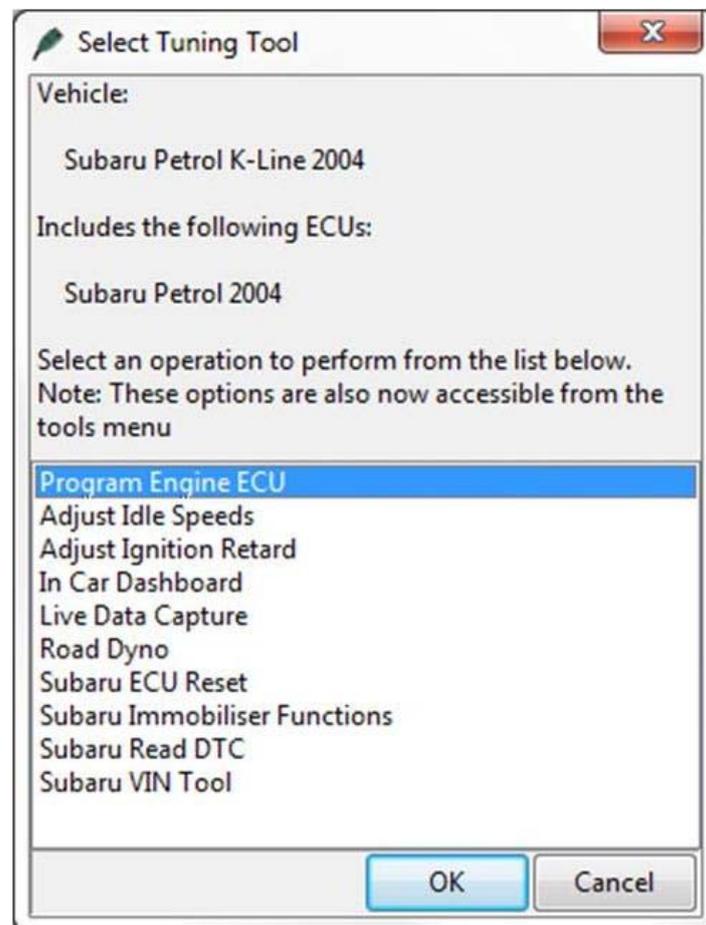
A confirmation message advising programming was successful will be displayed, then switch your ignition off and wait 15 seconds or so for the ECU to power down. Then switch ignition on, wait 5 seconds and then start the engine and let it idle for 15-20 seconds to let all systems initialise. You are now right to drive the car and test the results.

Please note that the ProECU Programming Kit is licenced for non commercial use only. This means any ROM files supplied will be specific to your vehicle (based on what you have requested at time of purchase) and will be coded to your hardware interface (meaning files from other cars will not be compatible with your software without appropriate upgrades via your supplying Tuner).

You cannot view or edit the contents of the ROM file or make changes to any of the mapping parameters, only load the supplied files received from your Tuner. If changes are required to the ROM files supplied, your Tuner will request log files from your car to assist in identifying any issues and will supply modified ROM files to suit.

Supplementary Vehicle Tools

There are multiple additional Vehicle Tools available with MY04-07 Subaru ECU's. When you initially selected the vehicle type, the following menu will have shown a range of possible options to select from:



The most likely options for use are checking/clearing DTC (fault codes), and resetting the ECU (clears learned fuel and ignition trims, resets the Advance Multiplier to default value, clears current and historic fault codes from ECU memory and more).

In some instances, some of the other options may be useful, but that comes down to the individual vehicle and the application in question. If you have any further queries on a particular option and whether it will be of use to you, just contact us as needed (although generally if you have to ask, you don't need to use it).

RaceROM Notes

A range of EcuTek RaceROM functions are available for configuration with this model range. For detailed further information please refer to the MRT Power Kit document covering your model.



All functions are applicable to tuned files only (ie NOT possible with the standard ECU mapping) and are configured upon request when you purchase your updated tuned ROM file for programming. Please speak with your sales representative for more information where needed.

The most common features include:

- Map Switching (gives the ECU the ability to store 2 separate tuned maps...for example low octane and high octane fuel, or low boost and high boost, etc).
- Launch Control (note whilst this option is available for both 5 sp and 6 sp manual transmissions, it can have adverse reliability impacts on the weaker 5 sp depending on frequency of use).
- Flat Foot Shifting (also known as Gear Change Ignition Cut).
- Autoblip on downchange.
- Per gear RPM limiting.
- Per gear fuel enrichment.
- Per gear boost control.
- Speed density mapping (for instances where the standard MAF sensor has been removed).

Data Logging

Please refer to the Appendix for detailed notes on checking live data from the OBD2 port for diagnostics purposes, or for logging data after a map has been loaded to send to your tuner for feedback and revision as necessary.



Vehicles Covered

All Subaru 2.5L petrol turbo models running Drive By Wire throttle from around 2007 through to approximately 2014 (where Subaru started gradually introducing the Direct Injected 2.0L petrol turbo model, first seen in the Forester XT in mid 2013 and in the WRX in mid 2014). Both SI Drive equipped models (typically the Impreza STi or Liberty GT / 3.0RB) and non SI Drive equipped models (WRX and Forester XT) are supported.

Cars in this range include:

- Subaru Liberty GT MY07-14 2.5L
- Subaru Forester XT MY07-13 2.5L
- Subaru Impreza WRX MY08-14 2.5L
- Subaru Impreza STi MY08-15 2.5L

Additionally some newer non turbo models are also covered:

- Subaru Impreza MY13-On 2.0L (Manual and CVT)
- Subaru Impreza XV MY13-On 2.0L (Manual and CVT)
- Subaru Liberty 3.0RB MY07-MY09 3.0L (Manual and Auto)

Fuel Notes

All models are (unless otherwise requested!) tuned for 98 RON premium unleaded fuel Tuning to suit 95 RON (and in the case of some models with additional supporting modifications, E-85) is also available on special request. Please note, it is imperative that you have your car tuned for the fuel you plan on running it on...in other words, don't request a tune for 98 RON and then run it on 95 RON most of the time as engine damage is a potential likely outcome.

Engine Notes

12-14 PSi = Standard Boost (depending on model)

17 PSi = Maximum Recommend Boost (on both 2.0L and 2.5L models due to engine internal strength, specifically pistons)

Recommended Modifications

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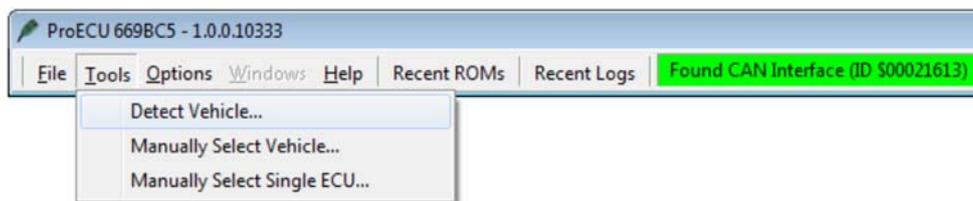
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Plug in your USB mini dongle (the software won't open without it), then plug the USB connection into your laptop, and only THEN plug the OBD2 connector into your vehicle. Recall from the initial setup instructions that when your ProECU software is open and the USB vehicle interface is plugged into the PC, you should have green background colour on the title bar. If not, you have software issues that need rectification before you go any further:

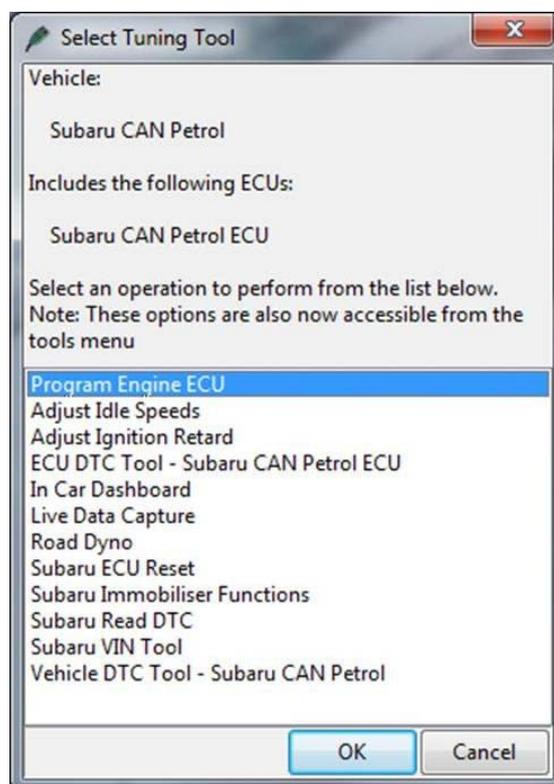
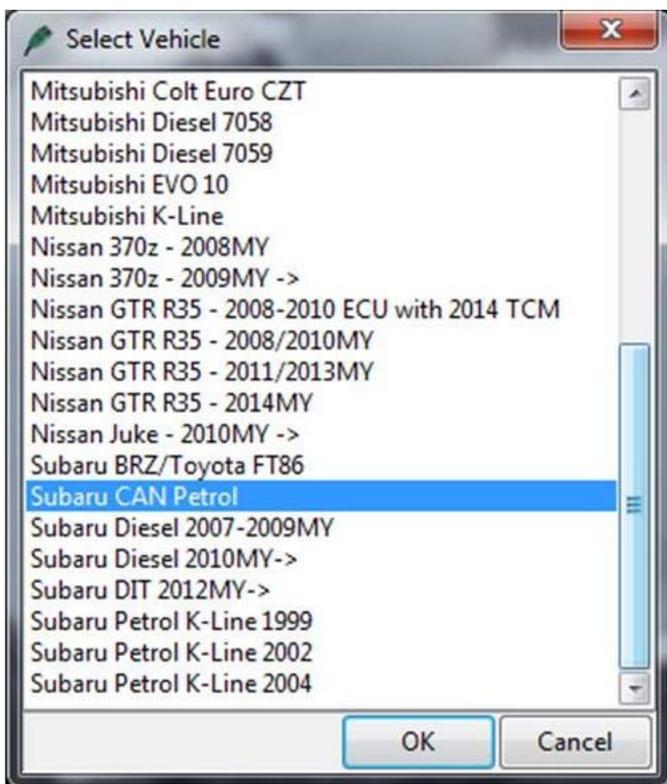


Locate the OBD2 port, found drivers side on centre underside of the lower trim just in front of the steering column (most models) or the foot well just above accelerator pedal (Liberty GT). Once you have everything connected and with the Ign ON (but engine OFF), go to the Tools Menu within ProECU and select "Detect Vehicle".



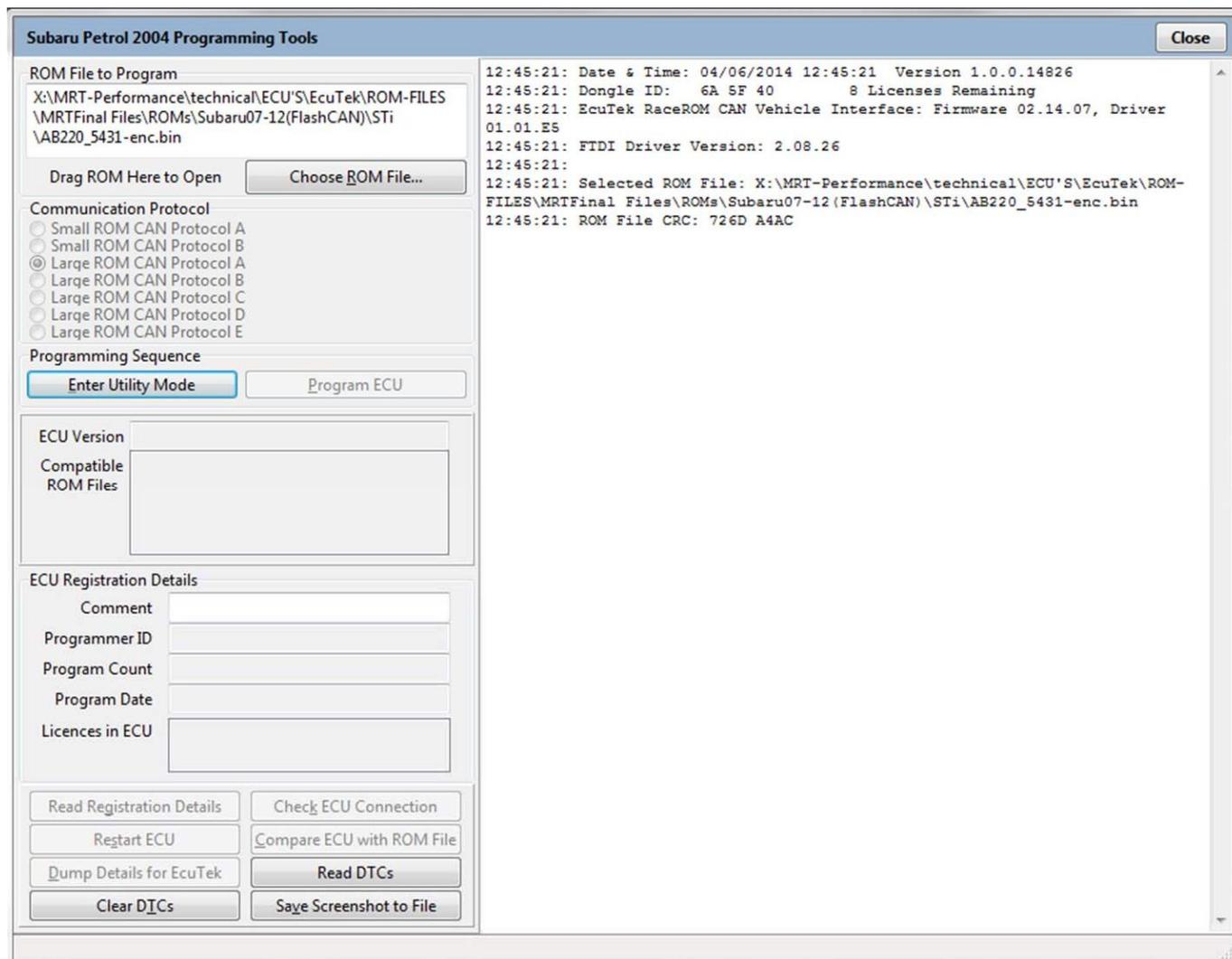
After a few moments, the software should have discovered your car and give you options for "Subaru CAN Petrol". Alternatively you can also achieve same by choosing "Manually Select Vehicle" from the Tools Menu and selecting Subaru CAN Petrol from the list that is presented.

Once the vehicle type is shown, select "Program Engine ECU" from the available options:



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After selecting Program Engine ECU from the Tools Menu, you will get the following screen:



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Once you have successfully entered Utility Mode, data will be populated within the ECU Version and Compatible ROM windows (along with the present EcuTek Registration Details found within the ECU if programmed previously) on the left hand side of the window. At this point you'll see a button at the bottom of the window saying "Save Screenshot to File". Hit this button, and a message will come up advising a screenshot has been saved as a .PNG file to C:\EcuTek\ScreenShots directory on your laptop, and depending on your version of Windows, Windows File Explorer will open to that location when you hit ok on the message. Email this file to us at tuning@mrtperformance.com.au and give us a call to confirm that we have received it.

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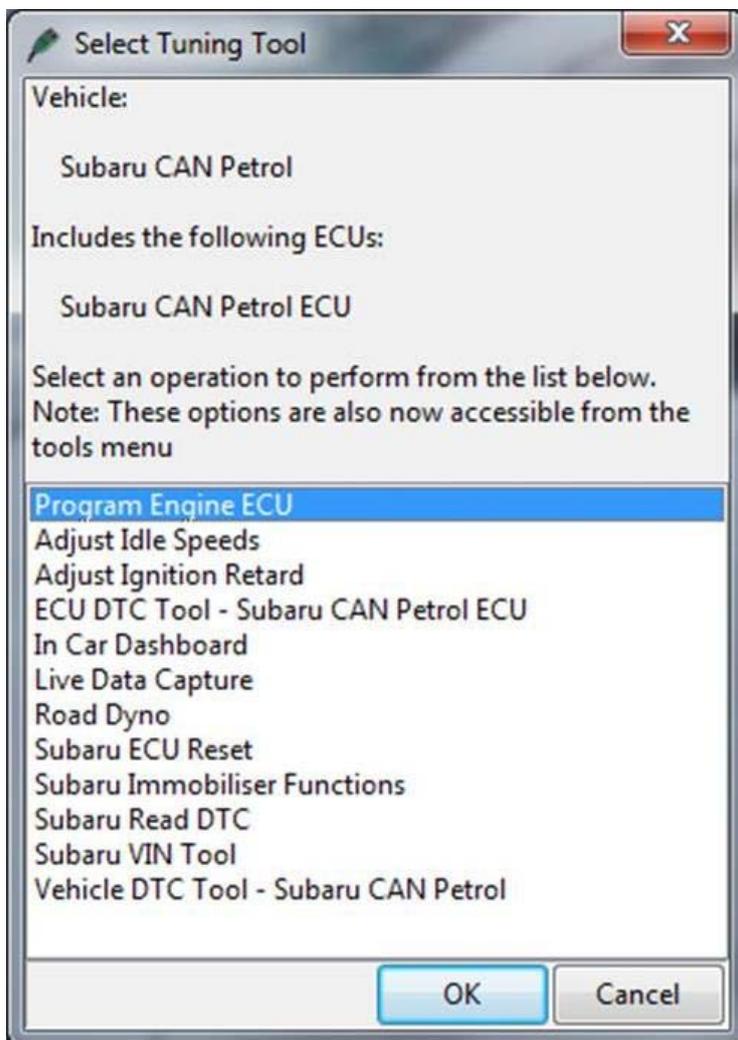
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- Speed density mapping (for instances where the standard MAF sensor has been removed).

Data Logging

Please refer to the Appendix for detailed notes on checking live data from the OBD2 port for diagnostics purposes, or for logging data after a map has been loaded to send to your tuner for feedback and revision as necessary.

Vehicle Specific Instructions - Subaru CAN Diesel



Vehicles Covered

All presently available Subaru 2.0L common rail turbo diesel models from MY08 onwards. This includes the Forester, Liberty and Outback among other models carrying this engine.

Fuel Notes

Diesel models only.



Engine Notes

22-23 PSi = Standard Boost

26-27 PSi = Maximum Recommended Boost (we typically tune to around 25 PSi in XA Kit)

Recommended Modifications

With extensive testing in our championship winning ARC rally Forester, we've found that fitting a larger exhaust has very minimal effect in terms of torque and hp output. Whilst the DPF can be problematic in terms of soot collection in vehicles that only do short trips, it is integrally located and positioned with the cat converter and removal is both difficult and can cause EPA issues. Excellent improvements can be found with tuning work only.

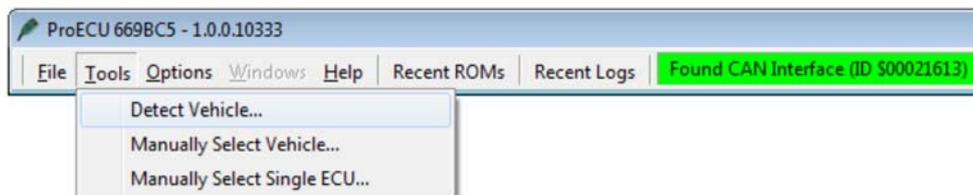
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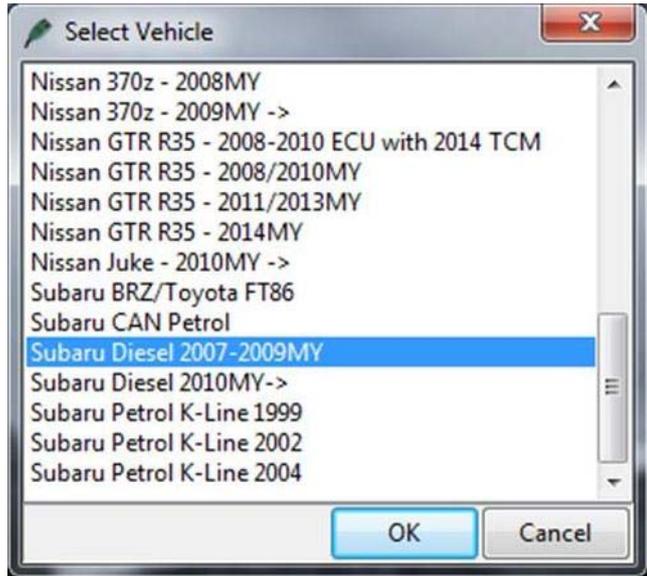
Plug in your USB mini dongle (the software won't open without it), then plug the USB connection into your laptop, and only THEN plug the OBD2 connector into your vehicle. This will prevent any potential for small voltage spikes on any CAN Bus present which can cause fault codes or DTC's. Remember from the initial setup instructions, with ProECU software open and the USB vehicle interface plugged into the PC, you should have green background colour on the title bar. If not, you have software issues that need rectification before you go any further:



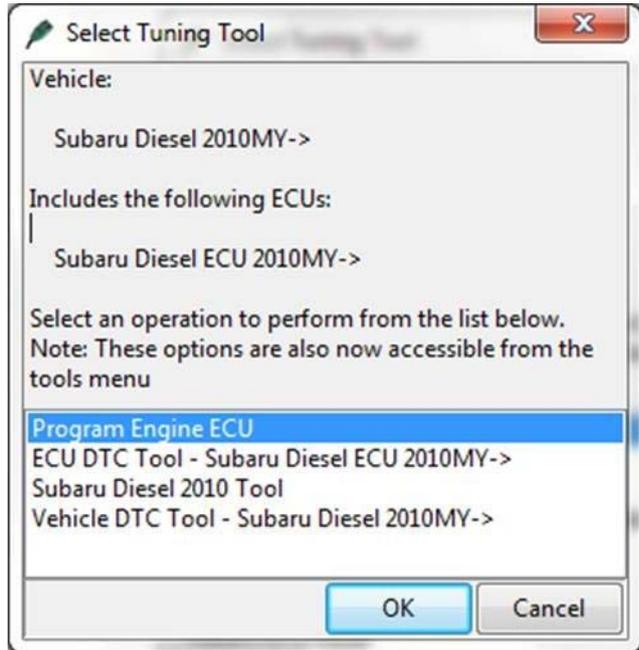
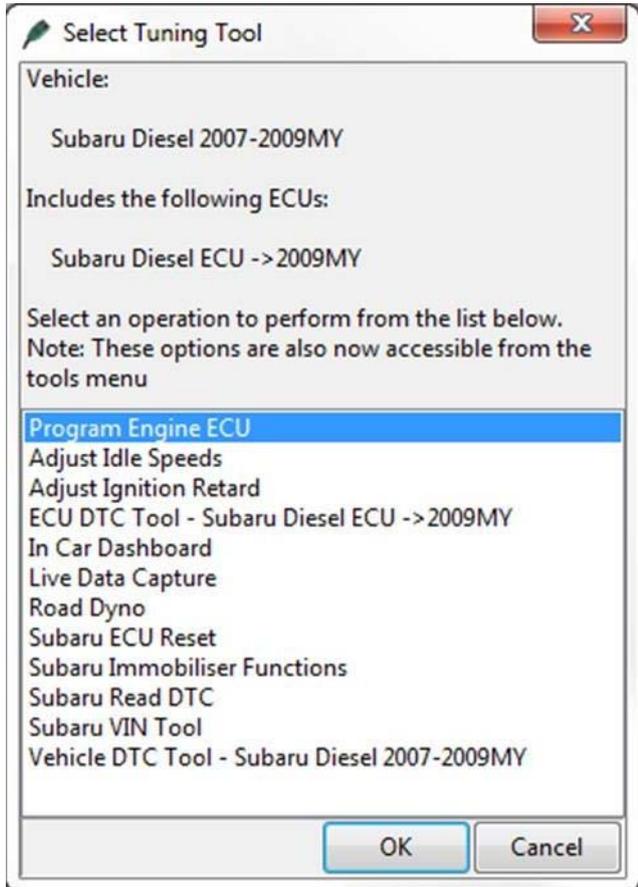
Locate the OBD2 port in the drivers foot well, just on the underside of the dash. Once you have everything connected, go to the Tools Menu within ProECU and select Detect Vehicle. Alternatively if you know where you are going you can also "Manually Select Vehicle" and choose from the list that is displayed afterwards. Make sure you have Ign ON (engine OFF).



If you choose to manually select the vehicle, simply select Subaru CAN Diesel from the list (depending on which range your model year vehicle fits into):



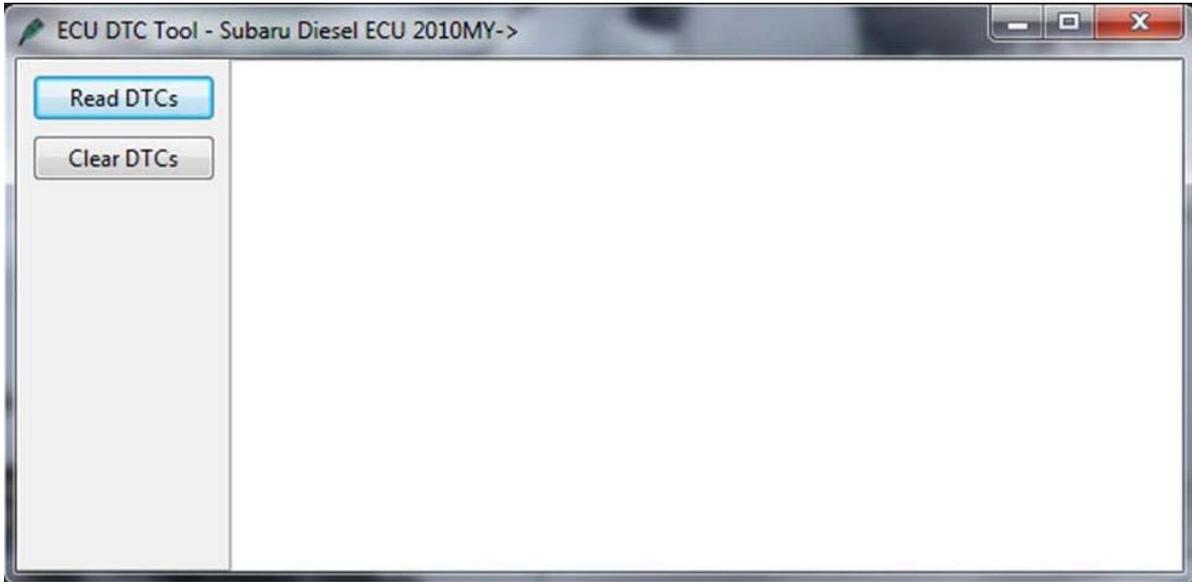
Once the software knows what vehicle you wish to talk to (either through auto detection or as a result of you selecting manually), you will be presented with options to select from. The options available depend on your model year vehicle:



The two primary ones you are most likely to use are the ECU or Vehicle DTC Tool, and the Program Engine ECU function. Additionally on MY10-on models, further options such as resetting the oil dilution ratio (after oil changes) or forcing a DPF regeneration are possible.

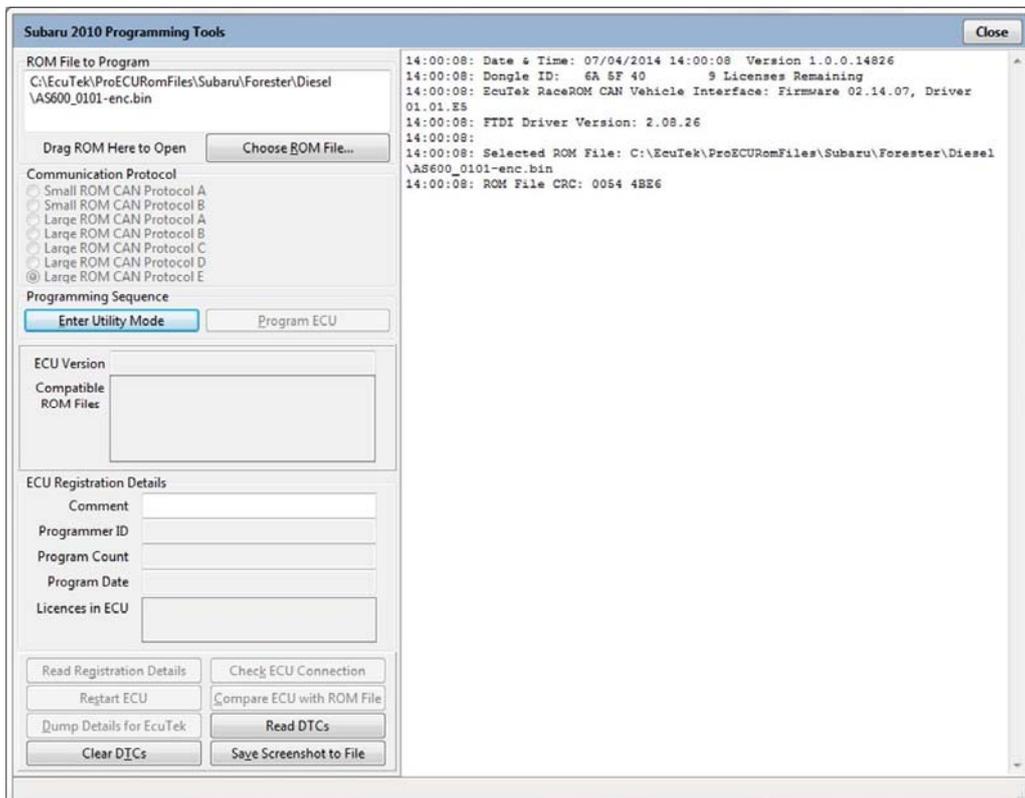
Checking/Clearing Fault Codes (DTC's)

You have two options with regards to checking and clearing any DTC's present. If it is an engine related code you are chasing, then select ECU DTC Tool. With this selected, ProECU will only search for codes within the engine management system, not any supplementary vehicle systems such as the ABS Module, Transmission Module, etc. Simply select read or clear DTC as needed. Detailed descriptions for the code aren't listed, just the code itself eg P0420. If you want to know what the code represents, Google it...pretty good chance someone somewhere has a description of it. Alternatively, if you want ProECU to read and clear all vehicle systems it has access to, select the Vehicle DTC Tool (both windows look the same):



Programming Engine ECU

If you select Program Engine ECU from the Tools Menu, you will get the following screen:



Before we can send you a compatible file for your car, we need to know what data file is contained within your ECU (otherwise known as a ROM file). To determine your ROM type, hit "Enter Utility Mode". **NOTE:** In order for ProECU to automatically select the correct communications protocols for your car, you either need a ROM file for your vehicle selected in the "Rom File To Program" window, or nothing in that window at all (if it auto detects a previously used file, select "Choose ROM file" and just pick any random document or file to force a file type error and the window will become blank once you hit Ok on the error message).

Once "Enter Utility Mode" is selected, wait a moment and data will be returned, populating the ECU Version and Compatible ROM windows on the LH side of the window (along with the present EcuTek Registration Details found within the ECU if programmed previously). At this point look for a button at the bottom of the window saying "Save Screenshot to File". Hit this button, and a message will come up advising a screenshot has been saved as a .PNG file to C:\EcuTek\ScreenShots directory on your laptop, and depending on your version of Windows, Windows File Explorer will open to that location when you hit ok on the message. Email this file to us at tuning@mrtperformance.com.au and give us a call to confirm that we have received it. If you are requiring a standard OEM ROM file for logging purposes or fault finding etc, then we'll be able to get something out to you via return email fairly quickly (typically inside an hour).

If you are in need of a tuned file for your car that you can program the ECU with for increased performance, then we'll need a little more information in order to provide you with the most accurate tune for your requirements. We will typically need to know:

- what fuel you are running the car on (eg diesel grade, or 95/98 RON if unleaded)
- if there are any existing modifications to the car (eg exhaust, intercooler, intake, etc)
- what you use the car for (eg heavy towing, performance use, etc)
- any other useful information that is out of the ordinary (eg you want optimum economy)

Tuned files, depending on your requirements and our workload, typically take 3-4 hours to prepare and get back to you via return email. Please note, contrary to common belief, requesting a tuned file for a car that you have sitting on the dyno at 4:45pm on a Friday afternoon is NOT the most effective way of getting things done! In many cases, we will ask for a logged data file of a road test or dyno run to be saved and sent back to us to verify everything is running properly with the car after tuning. See the Data Logging section in the Appendix for more information.

Please note, if you are wishing to program a tuned file into the car and it has NOT been programmed with EcuTek software previously, you will require a licence to do so. Please refer to the Appendix for further information on acquiring and loading a licence onto your hardware before proceeding.

Once you have a licence (if required) and the tuned file, it is simply a case of repeating the above instructions (assuming you closed the Programming Tools window and/or software while waiting for a ROM file to come back to you), selecting the file we have sent you in the "Rom File To Program" window at top left of screen and hitting the "Program ECU" button. Depending on file size, laptop speed, and ECU contents, programming can take between 30 seconds and 5 mins. On completion, ProECU will automatically clear all DTC's in various systems. Follow any additional instructions on screen where required to ensure this is completed correctly.

A confirmation message advising programming was successful will be displayed, then switch your ignition off and wait 15 seconds or so for the ECU to power down. Then switch ignition on, wait 5 seconds and then start the engine and let it idle for 15-20 seconds to let all systems initialise. You are now right to drive the car and test the results.

Please note that the ProECU Programming Kit is licenced for non commercial use only. This means any ROM files supplied will be specific to your vehicle (based on what you have requested at time of purchase) and will be coded to your hardware interface (meaning files from other cars will not be compatible with your software without appropriate upgrades via your supplying Tuner).

You cannot view or edit the contents of the ROM file or make changes to any of the mapping parameters, only load the supplied files received from your Tuner. If changes are required to the ROM files supplied, your Tuner will request log files from your car to assist in identifying any issues and will supply modified ROM files to suit.

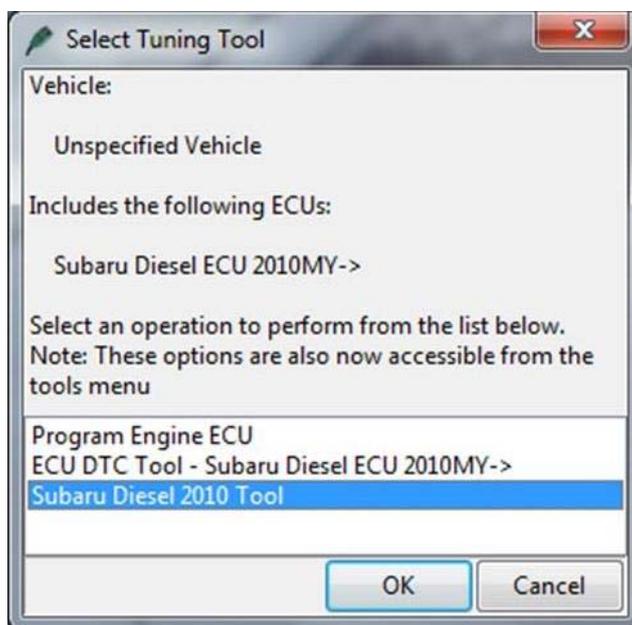
RaceROM Notes

No additional RaceROM functionality is available with Subaru Diesel models at this time.

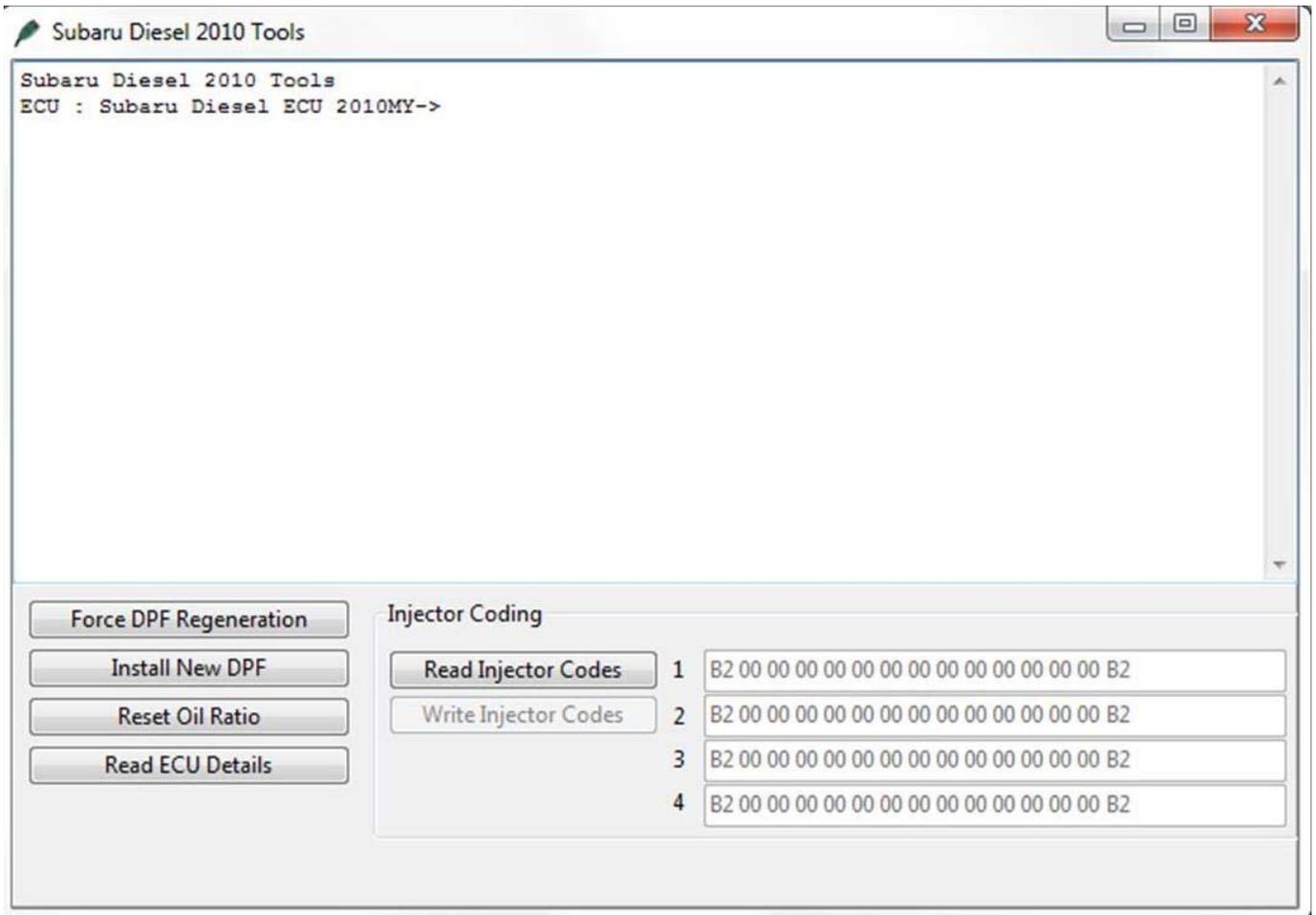
Supplementary Vehicle Tools - MY10-on Diesel Models

There are some additional tools available within the software for MY10-on models (MY07-09 use different ECU protocols for which these options are not presently available). These can be useful if you get your vehicle serviced outside the Subaru Dealer network, or if you do lots of small trips which doesn't allow sufficient time for active DPF regeneration during normal operation for example.

To access the Tools window, go back to the menu per above instructions, but this time select "Subaru Diesel 2010 Tool" from the available options:



Once you have selected this, a new window will open offering a range of options usually only available with the Subaru Select Monitor used at Dealerships.



In the unlikely event you need to replace injectors, then reading and writing new injector codes is required, but the most likely tools to be used are resetting the oil dilution ratio, forcing a DPF regeneration to occur, or resetting behind the scenes calculations after a new DPF has been fitted.

1/ Reset Oil Dilution Ratio

Typically only selected after an oil change, and resets the internal dilution counter which impacts on multiple engine management system operation parameters. Selecting this will reset things within a second or so once clicked and requires no further input.

2/ Force DPF Regeneration

The Diesel Particulate Filter (DPF) is a component of the exhaust system fitted to many late model cars equipped with diesel engines. It is designed to prevent soot emissions under day to day driving conditions and does so by filtering particulate from the exhaust gas as it passes through.

The engine management system actively monitors the content level of the filter through various calculations and sensor inputs and during certain operational conditions (typically highway driving above 80kph of 15+ mins or more) enters a regeneration phase where temperatures within the filter are raised high enough to burn off the contents. This "regeneration" process is vital to both the operation of the filter and its longevity. Multiple short trips or excess fuel injection (among other things) can cause soot levels to overwhelm its ability to regenerate on a regular basis and cause eventual clogging and failure (requiring expensive replacement). This is where forcing a DPF regeneration is useful.

With the engine running and at operating temperature, handbrake on, transmission in neutral (or Park if Auto) and vehicle stationary, select "Force DPF Regeneration". Follow the instructions on screen as needed. Please note this process can take upwards of 20-25 minutes or more depending on DPF content and condition.

Important Note: The DPF regeneration system has certain control limits due to the temperatures reached whilst the process is occurring. The more clogged a filter is, the higher the temperatures reached. If your vehicles calculated Soot Ratio is between 100-134%, the DPF warning light on the dash will be lit. If the Soot Ratio is above 135% then the vehicle will be in limp home mode (poor performance) and DPF light on dash lit also. In both of these instances forcing a DPF regeneration may not be immediately feasible depending on certain criteria being met by the ECU. The only option is to "trick" the ECU into thinking a new DPF filter has been fitted, and then running the DPF Regeneration command again. In extreme cases it may need to be run twice to properly clear out the filter, but the worst case scenario is some filters being beyond repair in which case Dealer replacement is the only option.

If you want to know what your Soot Ratio is, you will require the OEM ROM file from us in order to run live map access. Refer to the information in "Programming Engine ECU" above on obtaining said ROM file, and the Appendix on Data Logging for further information.

3/ Install New DPF

If a new DPF has been fitted, or if your Soot Ratio has climbed to very high levels and Forced DPF Regeneration is not feasible (DPF light on dash lit, vehicle in limp home mode and you will get an error message on screen and process will not complete when selected in 2/ above) then select this option and follow instructions on screen.

Data Logging

Please refer to the Appendix for detailed notes on checking live data from the OBD2 port for diagnostics purposes, or for logging data after a map has been loaded to send to your tuner for feedback and revision as necessary.

Appendix - Applying Licence Updates

Before you can program a supplied ROM file into your vehicles ECU, it must either already contain an EcuTek Licence (for example if the car has been tuned before by an EcuTek reseller) or you must have a licence on your dongle (which will be placed into the ECU the first time it is programmed).

Generally you will know if your vehicle has been programmed by EcuTek previously (because you will have bought it from someone second hand who told you so or showed you an EcuTek certificate that was supplied when they had the work done).

On first opening, ProECU software will tell you how many are present if you have less than 3 licences remaining, but once open you can also check whether you have any licences remaining on the Dongle ID being used by going to the "Help" Menu and selecting "Feature and Licence Information". The following information will appear:

The screenshot shows a window titled "Feature & License Information" with two tabs: "EcuTek Software Licensing" (selected) and "707 Supported Tuning ECUs | 577 Supported Diagnostic ECUs". The main area contains a list with "Retail Edition" selected. Below this is a form with the following fields:

Name	EcuTek Customer	Email Address	
Company		Phone Number	
Address 1		License Key ID	6A B0 BF
Address 2		Registration Code	1A6 79A 7C7
Post Code		Remaining Flash Licenses	1
Country			

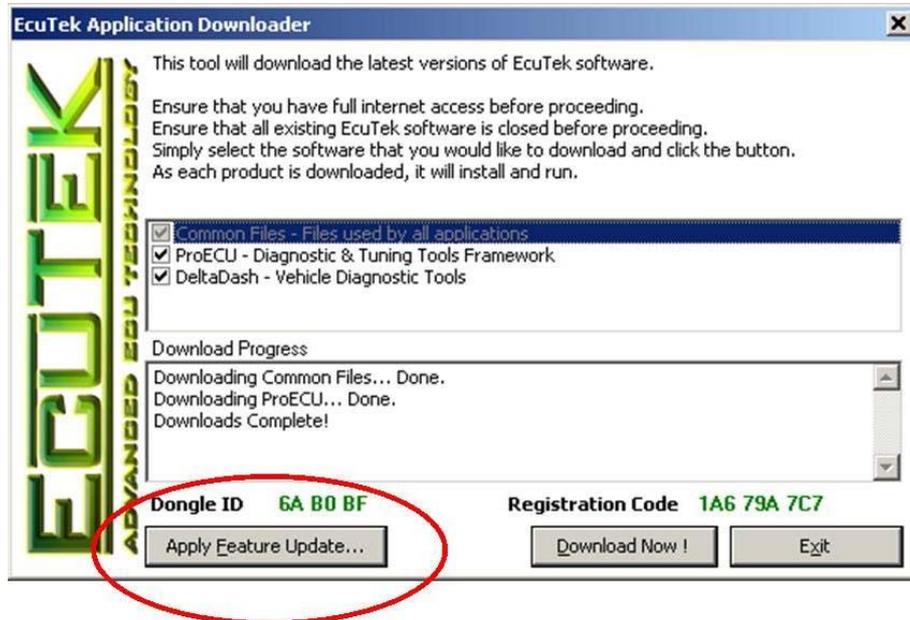
An "OK" button is located at the bottom right of the dialog.

IMPORTANT NOTE: If you have one or more licences already on your EcuTek USB Dongle, you do not need to apply a licence update. Updates only need to be purchased and/or applied should you wish to program a car that does NOT already have a licence held within the ECU (ie been programmed by an EcuTek tuner previously) AND you have 0 licences remaining.

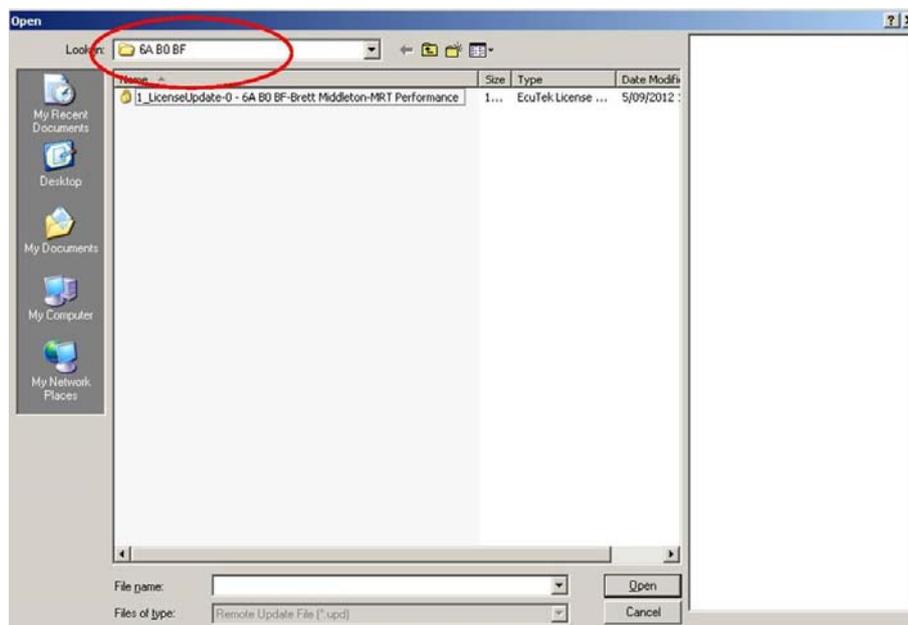
You can use your hardware to program multiple cars of the same model type OR differing models, however the acquisition of further licence codes and/or ROM files to suit will be required. Licences cannot be transferred between different ECU's or vehicles (ie you can't remove a licence from an ECU once programmed and transfer it to another vehicle). Please contact your reseller for additional information if you are unsure.

If you have requested a licence in order to program your car, it first needs to be downloaded from the EcuTek server. This can be done in two ways - run EcuTek AppDownloader or open ProECU and run "EcuTek Update" from the Help Menu. Once downloaded the update needs to be applied.

You can use EcuTek App Downloader...



...or you can open your ProECU software, and go to the "Options" Menu and select "Apply Licence Update". In both instances the following window will appear:



Simply select the most recent update (check the date of the file if there are multiple files) and apply as needed. You should get a confirmation message verifying it has been correctly applied. This same process needs to occur should you wish to program multiple vehicles and acquire additional licences in the future. If you want to check 100% that the update was applied correctly, simply follow the notes on the prior page.

Appendix - Data Logging and Retrieval Of Logged Files

Your ProECU software is used for all interaction with your vehicle – this includes the vehicle dependent special features mentioned earlier in this document, programming your ECU, and data logging and live data streaming via the ECU through the diagnostics port.

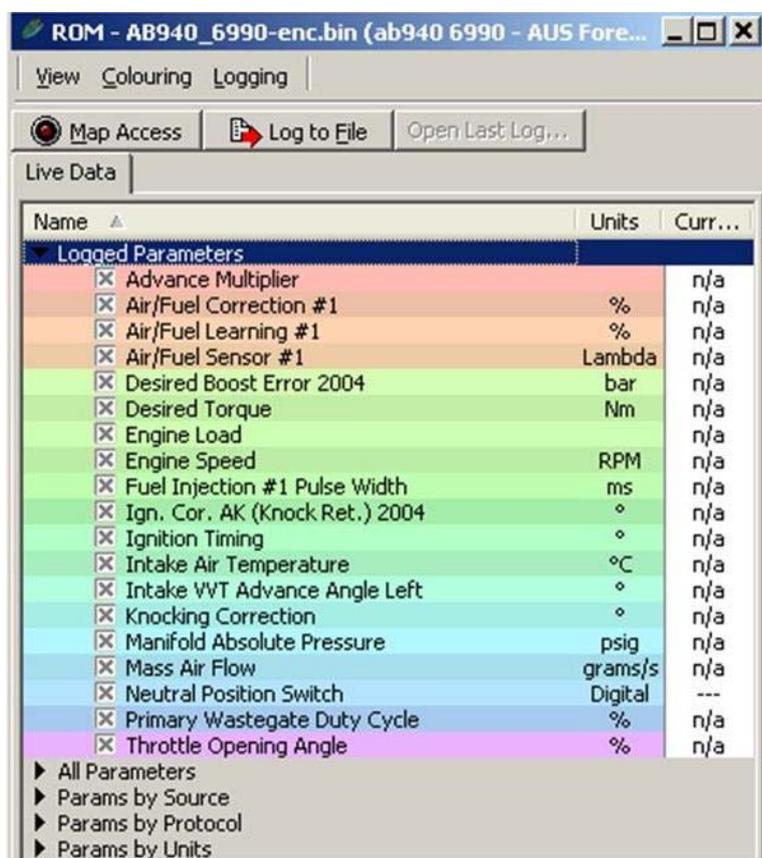
To access live data streaming or log data being streamed from the ECU, you will need to open the ROM file for the vehicle you are connected to within ProECU.

If you are checking a standard vehicle, you will need to obtain a standard ROM file from MRT for the vehicle you are checking. Refer to the Specific Vehicle Notes for more information

If you are checking a tuned vehicle, then open the most recent tuned file that has been programmed into the ECU.

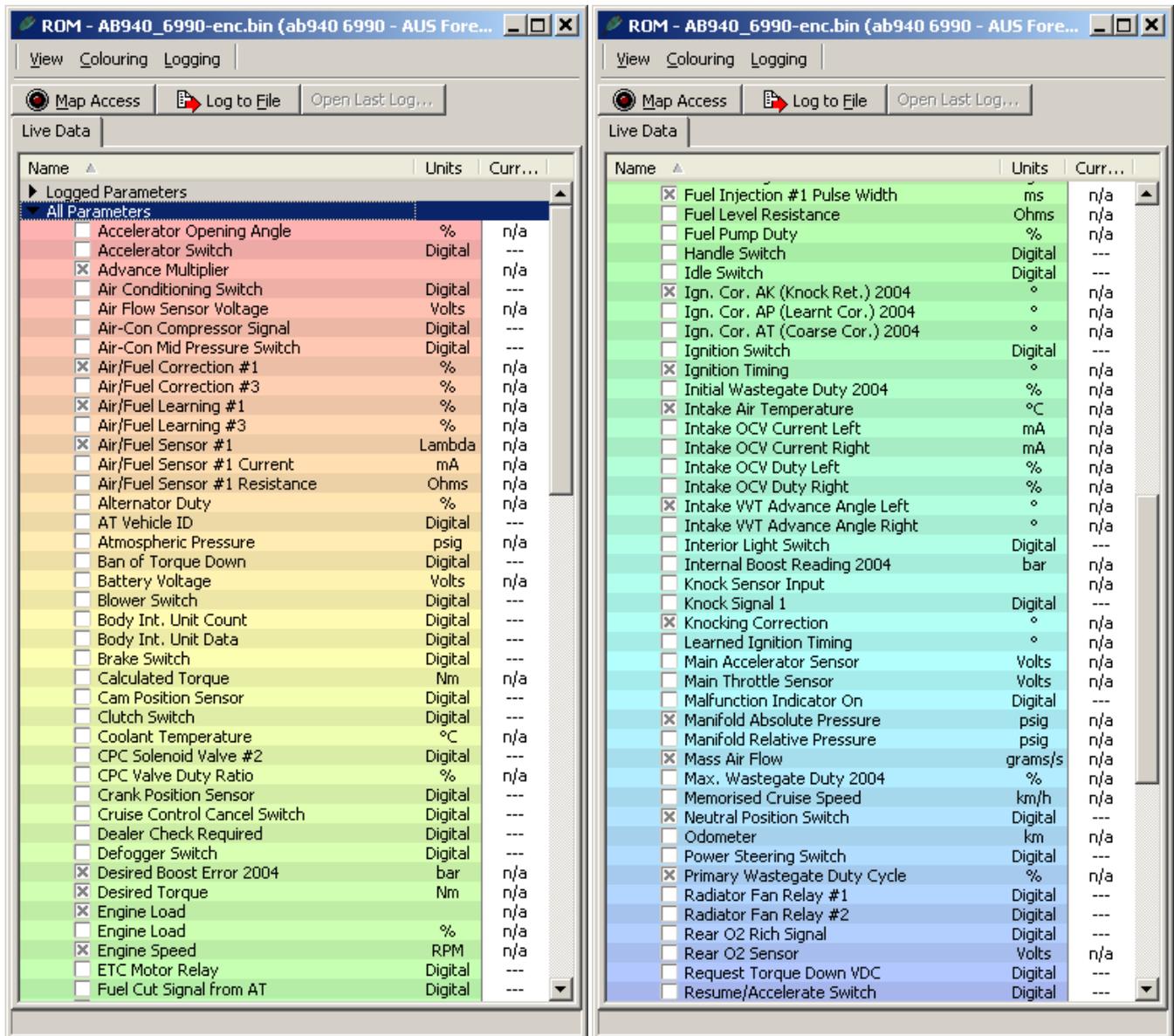
In either case the correct file MUST be used to ensure 100% accuracy with data streaming and content.

Once opened, your ROM file will look like the image right. A default list of parameters is shown selected depending on vehicle type. You can view the FULL list of available parameters by clicking on "All Parameters" to expand the list.



You can select or deselect parameters for live data streaming and data logging by clicking the check box on the left hand side of each parameter. Once you've selected your preferred options, click the "Map Access" button at the top of the window and, with your ignition on, live data will commence streaming. You can select or deselect parameters whilst Map Access is enabled as well.

Important Note: Make sure that before you road test and log your vehicles data that the engine is warm and everything is up to operating temp. If you aren't sure, drive it around the block for 4-5 minutes first then bring it to a standstill for a few seconds. This ensures that important vehicle systems (such as variable inlet or exhaust camshaft control, closed loop fuel control, etc) have had time to reset and recommence operation (especially after ECU programming).



Please note that the available parameters are dictated by model type and are dependent on what the vehicle manufacturer has configured the ECU to throughput via the OBD2 diagnostics port. In some model types, EcuTek have custom written parameters which can be selected and logged and these will be displayed in the list like any other.

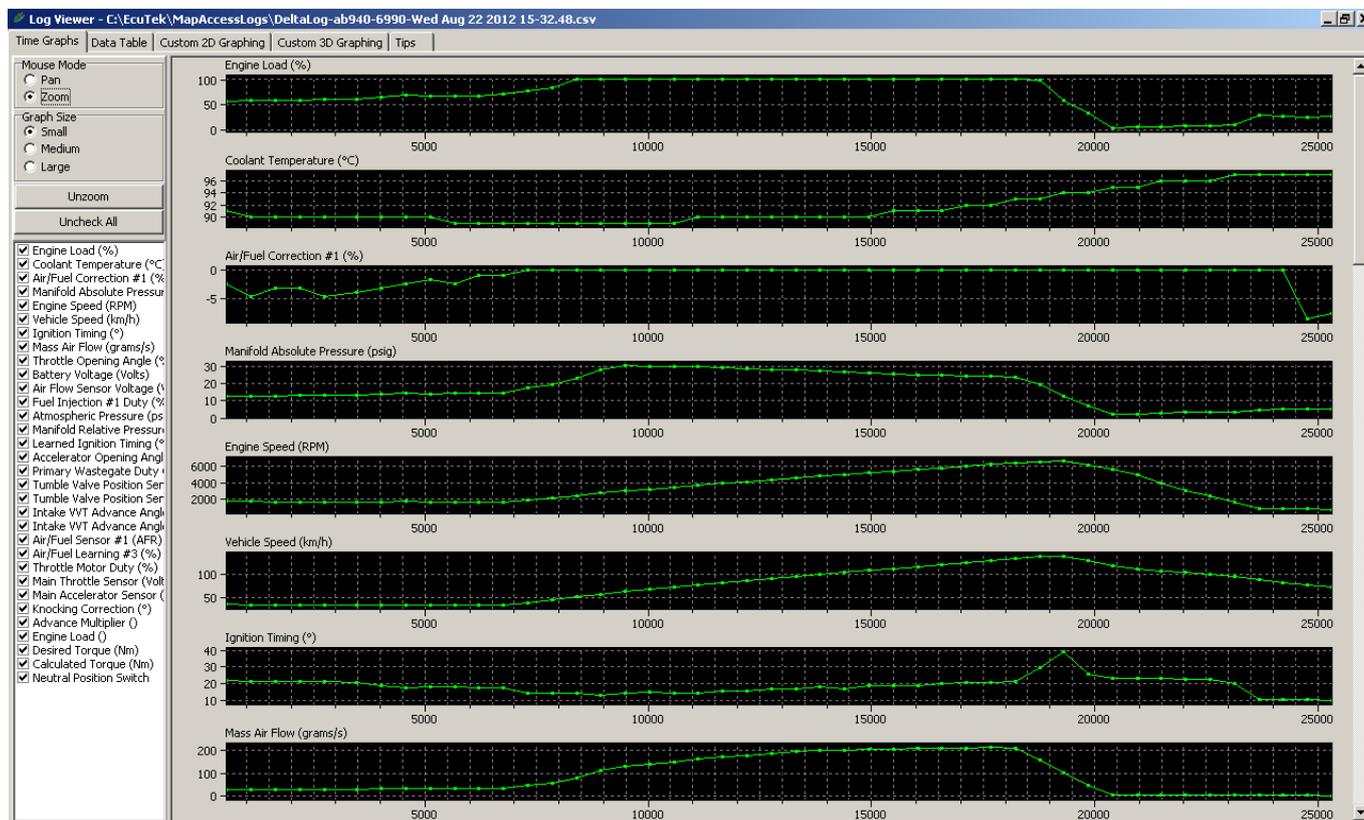
To log data to file, simply ensure you have Map Access running, then go for a drive. When ready to replicate the conditions you want to check (light throttle cruising, highway driving, idle, full throttle power runs, whatever you want to look at in more detail) click "Log To File" to commence logging. When done, click "Log To File" again to cease logging and the data will be saved to your hard drive. You can log data for as long as you remain connected with Map Access running and have hard disk space, and as many or as few parameters as you wish. On some vehicles, logging more data slows the sample rate and vice versa (so fewer parameters means quicker sample rates, especially on Subaru models).

Important Note: Make note of your logging directory as you will need to know where you've saved the data when opening it to view, or to send it via email to your Tuner if requested. The default directory is c:\Ecutek\MapAccessLogs and the file is a CSV file saved with the date/time the log was created.

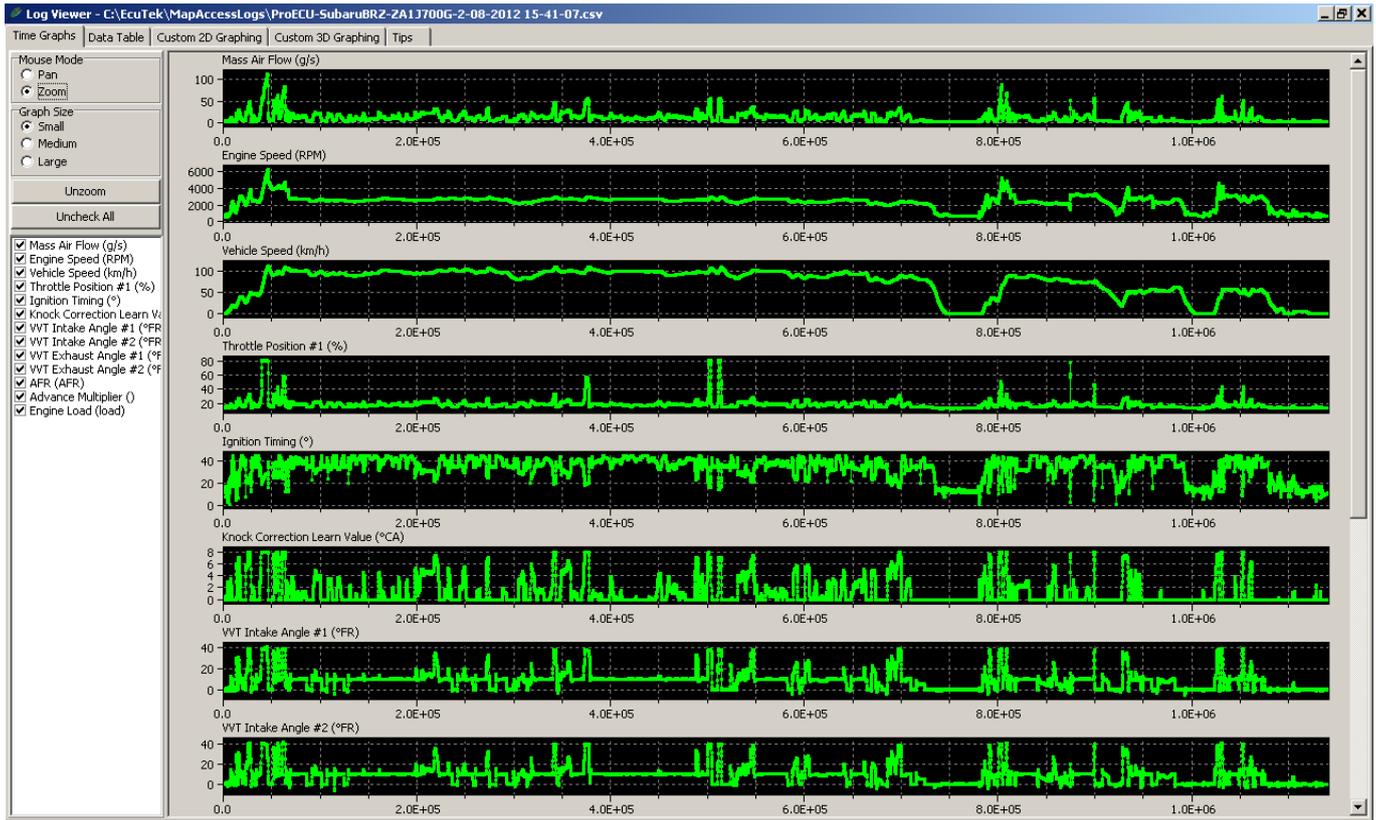
Once you've logged some data, go to "File" and "Open Log File" in the Menu. The following table of data will open (plus/minus parameters depending on your selection for logging):

Time (ms)	Minimum	Maximum	546	1108	1654	2200	2746	3479	4025	4571	5117	5663	6209	6755	7301	7847	8393	8939	9485	10031	10577	11123	11669	
Engine Load (%)	4.7	100	55.7	59.2	59.6	59.2	60	60	65.9	68.6	67.5	67.5	67.8	72.2	78.4	83.5	100	100	100	100	100	100	100	100
Coolant Temperature (°C)	89	97	91	90	90	90	90	90	90	90	90	89	89	89	89	89	89	89	89	89	89	89	90	90
Air/Fuel Correction #1 (%)	-8.6	0	-2.3	-4.7	-3.1	-3.1	-4.7	-3.9	-3.1	-2.3	-1.6	-2.3	-0.8	-0.8	0	0	0	0	0	0	0	0	0	0
Manifold Absolute Pressure (psig)	2.5	30.3	12.6	12.8	12.8	13.1	13.3	13.6	14.1	14.4	14.2	14.4	14.7	14.8	17.8	19.6	22.9	27.9	30.3	29.7	29.7	29.7	29.5	29.5
Engine Speed (RPM)	857	6537	1766	1750	1739	1734	1726	1730	1728	1741	1737	1738	1735	1734	1941	2219	2476	2774	3066	3251	3452	3659	3911	3911
Vehicle Speed (km/h)	36	137	37	36	36	36	36	36	36	36	36	36	36	36	40	46	52	58	64	68	72	77	81	81
Ignition Timing (°)	10	39	22	21.5	21.5	21	21	20.5	18.5	17.5	18	18	17.5	17.5	14	14.5	14.5	13	14	15	14	14.5	15.5	15.5
Mass Air Flow (grams/s)	4.4	209.92	28.14	27.24	28	28.67	29.33	29.59	32.12	32.04	32.39	32.26	32.64	33.42	45.53	58.56	81.17	111.58	131.3	139.4	148.8	161.72	170.6	170.6
Throttle Opening Angle (%)	3.1	100	16.5	16.5	16.5	17.3	17.6	18	20.4	20	19.6	20	20.4	21.2	100	100	100	100	100	100	100	100	100	100
Battery Voltage (Volts)	12.5	14.3	13.4	13.1	13.2	13.1	12.9	13	12.9	12.8	12.9	12.7	12.7	12.6	12.5	12.6	12.6	12.5	12.5	12.6	12.5	12.8	13	13
Air Flow Sensor Voltage (Volts)	1.3	4.2	2.28	2.26	2.28	2.3	2.32	2.38	2.38	2.38	2.4	2.4	2.42	2.7	2.9	3.22	3.54	3.64	3.74	3.82	3.9	3.94	3.94	3.94
Fuel Injection #1 Duty (%)	0	70.77	8.29	8.21	8.16	8.51	8.47	8.49	8.85	9.28	9.26	9.27	9.62	9.62	14.08	18.46	25.88	37.88	47.09	47.85	50.07	54.63	57.56	57.56
Atmospheric Pressure (psig)	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7
Manifold Relative Pressure (psig)	-12.2	15.7	-2	-1.9	-1.9	-1.6	-1.3	-1.2	-0.6	-0.3	-0.4	-0.3	0	0.1	3.2	5.1	8.4	13.3	15.7	15.1	15.1	15.1	14.8	14.8
Learned Ignition Timing (°)	0	8	7	7	7	7	7.5	7.5	7.5	7.5	7.5	7.5	8	8	8	8	8	8	8	8	8	8	8	8
Accelerator Opening Angle (%)	0	100	18	17.6	18	19.2	20	20	23.1	23.5	23.9	24.7	25.5	31.8	100	100	100	100	100	100	100	100	100	100
Primary Wastegate Duty Cycle (%)	0	90.2	18.4	18	18.8	20.8	22	22.7	32.5	34.1	34.5	35.7	38	43.9	84.7	85.9	76.1	72.5	72.5	72.5	72.5	72.5	72.5	72.9
Tumble Valve Position Sensor Right (Volts)	0.82	3.66	0.82	0.82	0.82	0.86	0.82	0.82	2.56	3.66	3.66	3.62	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.64	3.66	3.66
Tumble Valve Position Sensor Left (Volts)	0.82	3.6	0.82	0.82	0.82	0.86	0.82	0.82	2.66	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.58	3.6	3.6	3.58	3.6	3.6
Intake VVT Advance Angle Right (°)	0	32	27	27	29	29	30	31	31	31	31	31	31	31	32	32	31	30	28	27	26	24	23	23
Intake VVT Advance Angle Left (°)	0	32	27	28	29	29	30	30	30	31	31	31	32	31	31	32	31	31	28	27	25	24	23	23
Air/Fuel Sensor #1 (AFR)	11.13	20.31	14.45	14.57	14.68	14.57	14.45	14.57	14.68	14.45	14.57	14.45	14.57	12.73	12.16	11.47	11.13	11.13	11.13	11.13	11.13	11.13	11.13	11.13
Air/Fuel Learning #3 (%)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Throttle Motor Duty (%)	-20	50	21	4	20	17	15	17	17	17	20	17	20	31	14	19	20	18	11	18	20	9	30	30
Main Throttle Sensor (Volts)	0.66	3.94	1.1	1.08	1.1	1.12	1.14	1.14	1.22	1.2	1.18	1.2	1.22	1.26	3.92	3.92	3.92	3.92	3.92	3.92	3.94	3.94	3.92	3.92
Main Accelerator Sensor (Volts)	0.68	3.02	1.38	1.38	1.38	1.4	1.42	1.42	1.48	1.48	1.48	1.5	1.52	1.66	3	3.02	3.02	3.02	3.02	3.02	3.02	3.02	3.02	3.02
Knocking Correction (°)	-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

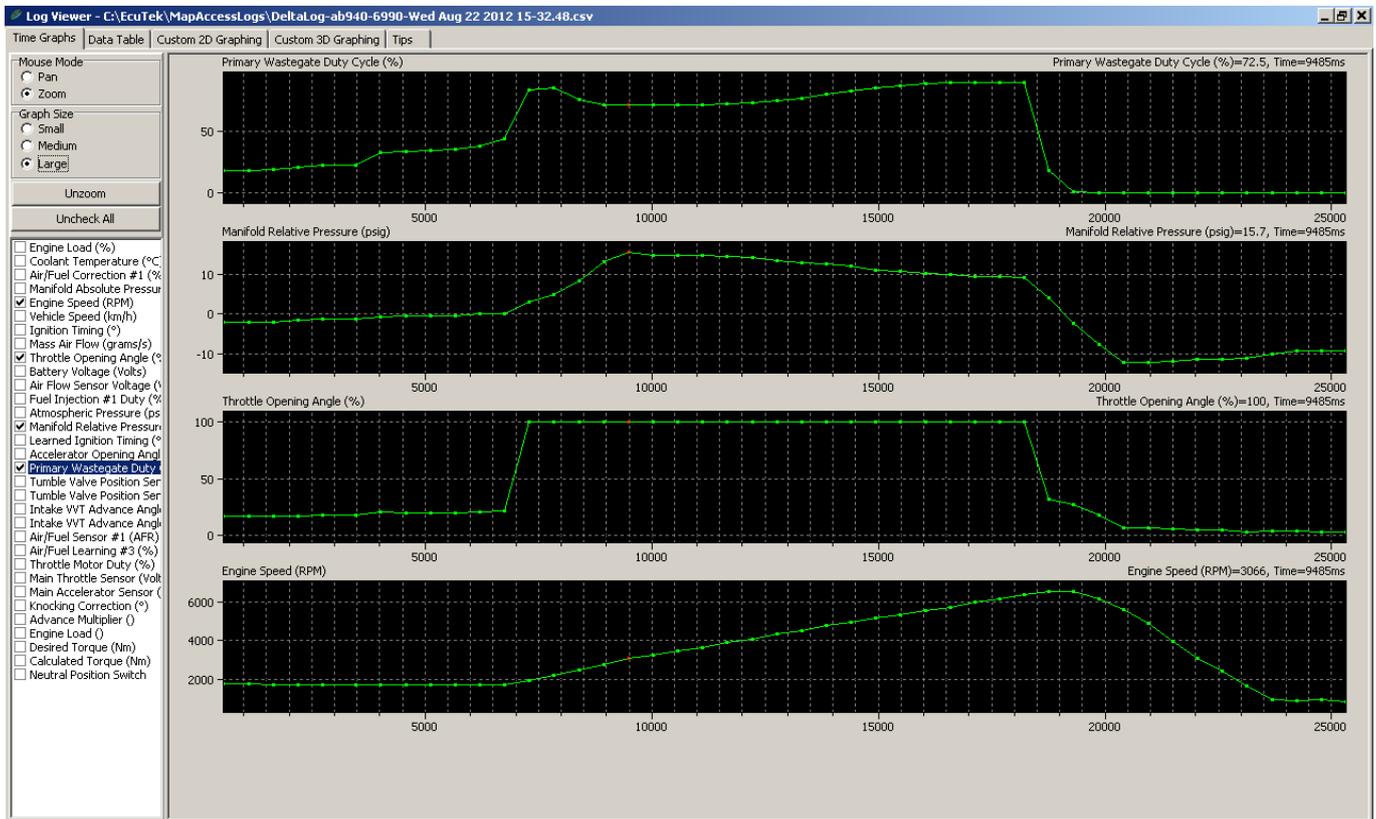
Whilst this gives every single data sample saved for every parameter, it isn't the most visually appealing or easy to find what you are looking for so best option is to click the "Time Graph" tab at top left and you'll get:



Longer test drives might look like the following:



You can zoom in on data, change graph sizing or deselect unnecessary parameters to declutter the screen and focus on selected things (for example if you are checking boost levels, you might just want a couple of key parameters on screen):



Clicking anywhere within the data will show the data value recorded for each parameter at that point on the right hand side next to the data label. A red dot within each graph on screen represents the data point being shown.

You can manipulate your saved data any way you need – and if what you were trying to monitor occurred during your test drive, it will be there. 😊

If you are attempting to log data for your Tuner to show a specific problem, don't send a 3 hour long log and say "it happened in there somewhere". The more detailed the information you can provide, the faster your Tuner will be able to assist you. If you can replicate the fault then ideally hit "Log To File" to start logging, make the issue occur, then hit "Log To File" to cease logging. This way the fault is captured concisely and your Tuner doesn't have to search for a needle in a haystack.

Important Note: If you have been supplied a tuned file and your Tuner has requested a log to verify vehicle performance and operational parameters, then generally (assuming you don't have a dyno) you will need to find a clear section of road (probably highway or freeway due to the potential speeds involved) and complete a 3rd gear full throttle run through the RPM range. So in a petrol turbo Subaru, this might typically be 2000-6300rpm, while a BRZ/86 might be 2000-7000rpm or a Triton DiD might be 1500-4200rpm. Verify with your Tuner if unsure.

Appendix – Using RaceROM Features

Depending on your vehicle, certain RaceROM features can be enabled. All functions are applicable to tuned files only (ie NOT possible with the standard ECU mapping) and are configured upon request when you purchase your updated tuned ROM file for programming. Please speak with your sales representative for more information if needed.

The most common features include:

- Map Switching (gives the ECU the ability to store 2 separate tuned maps...for example low octane and high octane fuel, or low boost and high boost, etc). On models equipped with SI Drive (eg later Liberty GT and Impreza STi models) the switching functionality is incorporated within this system, other models are typically switched via a combination of full throttle and the rear demister switch.
- Launch Control (note whilst this option is available for both 5 sp and 6 sp manual transmissions, it can have adverse reliability impacts on the weaker 5 sp depending on frequency of use).
- Flat Foot Shifting (also known as Gear Change Ignition Cut). Recommended for use only on engines which have been built for performance applications (ie not standard OEM pistons).
- Autoblip on downchange.
- High and low boost settings.

Features such as launch control, autoblip on downchange and flat foot shifting can be on in one map and off in another, activated all of the time or various combinations thereof.

Map Switching

The two alternate maps are known as Road (typically the default map on initial engine start) and Race. Later model cars such as the BRZ/FT-86, MX-5 and Subaru WRX DIT have additional maps (up to 4 total including the default) which can be configured. The various other options such as launch or blip and so on are typically configured within these two modes.

On SI Drive Models:

- Road = S Mode
- Race = S# Mode

On Non SI Drive Models:

- Road = Base mode the vehicle starts in majority of the time.
- Race = Optional map switched into via driver input.

To switch maps on Non SI Drive models, a combination of full throttle followed by the rear demister switch being triggered from OFF to ON is used. The ignition must be on, but engine can be running or not, and vehicle can be moving or stationary. If the engine is running, the change from Road to Race is confirmed by a flashing sequence of the check engine light on the dash. The switch from Race back to Road is confirmed by a solidly lit check engine light on the dash.

If the Rear Demister is ON already, switch it off before attempting a change otherwise the ECU will not see the correct trigger sequence and will NOT initiate a map change.

Launch Control

Launch control can be armed all the time, as it is only activated when a certain set of criteria are met...and typically you'll only meet these criteria if you are attempting to launch the car off the line so it is highly unlikely you will trigger it inadvertently.

Firstly, make sure you've got traction and stability control off otherwise you'll launch and bog down almost instantly as the ECU cuts torque due to wheel spin. The following conditions must then be met:

- Road speed less than 8kph
- Transmission in 1st Gear
- Clutch pedal in
- Full throttle

Whilst active, engine RPM is limited to a preset level (typically 4500-5000rpm depending on model and what has been preconfigured by your tuner) and on turbo models ignition timing is retarded to build heat in the exhaust system and build turbo boost whilst stationary just prior to launch. Initial launch RPM on later models can also be adjusted by the driver in real time via the cruise control stalk (up to increase 250rpm from initial launch preset, down to decrease 250rpm from initial launch preset, etc).

To launch, simply step off the clutch. Once the ECU sees the clutch pedal disengaged and/or vehicle speed over 8kph, launch is disabled and full throttle reinstated.

AutoBlip On Downchange

Designed to better match engine RPM with road speed when downchanging from one gear to another, this can also be armed all the time if you wish. Autoblip is mostly preconfigured and not user adjustable, with the following criteria needing to be met prior to activation:

- Road speed must be above 40kph
- Foot must be on brake pedal (ie vehicle slowing)
- And lastly, clutch depressed.

Depending on engine speed, a proportional amount of throttle will be applied automatically by the ECU when the clutch is depressed, sufficient enough so that on completion of the gear change engine RPM should closely align with the RPM seen with the newly selected gear.

Flat Foot Shifting (aka Gear Change Ignition Cut)

Designed for track use, this function allows the driver to keep their foot buried on the accelerator pedal during gear change without engine RPM climbing higher than what it was at point the clutch pedal was depressed and gear change was initiated. And yes, you **MUST** still use the clutch.

With road speed above 40kph, keep your foot on the throttle and depress the clutch – engine speed will be limited via ignition retard for as long as the clutch pedal is in, and is reinstated once clutch is released.

High & Low Boost Settings

Typically configured so that Road Mode = low boost (minimum that can be run is wastegate tension, so around 7-8 Psi on a standard WRX/STi turbo), and Race Mode = high boost.

Simply switch maps per prior notes and you'll get whatever your tune has been configured for.

Appendix - Troubleshooting

Generally speaking, the programming process is reasonably fool proof. However if you run into difficulty, there are a couple of things to check.

First, the most obvious. The ignition must be ON, engine must be OFF, and you must be connected to the OBD2 port properly.

Some connections on some vehicles are tight, wiggle them a little to ensure you haven't got a loose connection. If you are seeing the message to the right, then one of these is typically at fault.



Sometimes the CAN bus can time out (especially after a communications error – on Subaru CAN models the temp gauge on the dash will flick straight to High), in which case simply turn the ignition off, then turn it back on and try again.

Make sure your vehicle battery has at least 11.5-11.6v supply. Flat batteries don't make for successful ECU programming!

It is highly unlikely, but programming failures can happen occasionally on all vehicles for a variety of reasons. Sometimes the reason is obvious, like a cable falling out, turning off the ignition midway through programming or laptop battery running out of charge. Other times it's hard to tell what caused the failure. The good news is that in almost all cases, the ECU can be fully recovered. If you encounter any errors of any kind please contact your place of purchase for more information and directions.