



Tech Articles

DIY Tuning, Part One

By: Ryan Gick

In past articles we have discussed the functions of the ECM, its sensors/inputs, its controlled devices/outputs, modes of operation, terminology, and scan tools. Now it is time to put all of that information to work. If you have not read all of these previous Gick's Garage articles, I encourage you to read them so you can fully understand the topic I am about to discuss. In this article, I am going to begin a multi-part series explaining the tuning process, what's involved, and what tools you will need in order to do the job. There are many companies available that offer hardware and software that you will need in order to tune a particular ECM. I am going to discuss the ones I use, but there are others. It is important to note that there are many different tuning styles or ways of setting up and performing a tune out there. What will be discussed in these articles is the way I do it.

The first thing you will need is a laptop computer. A desktop PC can be used for tuning but it will be difficult to take with you in your car on a test drive if you want to use PC-based scanning software or an emulator. Although not absolutely necessary, it would be beneficial to have a computer in the car in order to use some of the more advanced scanning and tuning software available. The portable nature of the laptop computer is better suited to this task. Whichever type of computer you get to use for this purpose must meet the minimum requirements of whatever software and hardware you plan on using with it. If you are using a laptop, it should also have a good battery. The last thing you want is to have your battery run out in the middle of a scan log or real-time tuning session.

Data Acquisition

You will need a way to get scan data from your ECM. You can use a hand-held scan tool or you can use laptop computer-based scanning software to accomplish this task. If you are using a factory Fiero ECM, chances are WinALDL will work with it. You can download WinALDL for free from the Internet from this source: <http://winaldl.joby.se/>. Another free scanning program available for Internet download is FreeScan; you can find it here: <http://www.andywhittaker.com/ECU/FreeScan/tabid/70/Default.aspx>. If you are working with an OBD2 PCM, then HP Tuners might be a good choice. They offer just a scanner or a complete scanner and tuning software suite. They can be found here: <http://www.hptuners.com/>.

Hardware

The next thing you will need is a way to either burn chips or connect your laptop computer to the computer in your car. Software programs made to work with OBD2 PCMs usually include an interface cable and everything you need to do this. If you are working with an OBD-1 computer, then you will either need to purchase a PROM (chip) burner or emulator. Moates sells chip programmers and emulators: <http://moates.net/>. An emulator is a device that takes the place of the PROM chip but is connected to a laptop computer and allows for real-time changes to be made to the programming while the engine is running. The use of an emulator can greatly speed up the tuning process because you will not need to wait to erase and program PROM chips. If you decide to not use an emulator and wish instead to buy a chip programmer, you may need a PROM chip eraser. A PROM chip eraser is basically a UV lamp. When the open window of an EPROM chip is exposed to UV light, the microchip inside will be erased (after a certain amount of exposure time). Newer chips are available for most all GM OBD1 applications that don't require a UV light to erase. These are known as either EEPROMs (electronically-erasable) or Flash-Memory (flash-reprogrammable) chips. Moates.net sells these types of chips and adapters so they can be used in older ECMs like those found in stock Fiero applications. If you wish to use the stock type EPROM chips that came in your factory ECM, you will need a PROM burner that can program these types of chips. Transtronics sells such devices: <http://www.transtronics.com/>. ABRA Electronics sells new stock-type EPROM chips: <http://www.abra-electronics.com/>.

Software

After you have gathered all of your hardware and means of scanning the computer, you will need a way to edit the content of the PROM chip (or programming stored inside of the PCM). As mentioned earlier, if you are working with an OBD-2 PCM and you are using HP Tuners, their VCM Suite should come with the editing and scanning software (everything needed) to do the job. If you are working with an OBD-1 computer, then you have a couple of choices. If you bought an emulator from Moates.net, it should come with a copy of TunerPro RT: <http://tunerpro.markmansur.com/>. Also available is one of my favorites and that is TunerCat: <http://tunercat.com/>. There are some free editing programs available on the net like WinBin but these tend to be limited in capability or what vehicles they will work with. My best advice here is to do some research and see if the tuning software you are buying best suits your needs. It is always good practice to read any documentation that comes with the software so you can understand how to use it.

After you have gathered all of the hardware and software you will need in order to scan and tune your computer, you will be ready to dive into the actual tuning. But that will need to wait until our next article of Gick's Garage. In the next issue of Fiero Focus, I will discuss how to get started in the tuning process, how to determine when a change needs to be made, and how to go about correctly making those changes.

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