

Performance Tuning for your Miata All years

I have written this article just to give you an idea of what can be done if you want to pep up your Miata's performance without spending a lot of money for mechanical upgrades. All Miatas come from the factory with a computer that manages all functions of the motor, and many other items in the car. As far as the motor is concerned, it monitors and controls every firing of the spark plugs, and every drop of fuel that is sprayed into the motor. The computer controls this based on the RPM of the motor, the gear your transmission is in, the operating temperature of the motor, the temp of the air going into the motor, and the speed the car is traveling. The computer is commonly called the ECU (engine control unit). I have recently learned that here is a way to get some extra power from your Miata with a "Performance Tune" for the Miata's computer.

If you have ever worked on an older, pre computer car, you know you could control the timing, and change the jets in the carburetor, to change the performance of the motor. It is not that easy with today's newer cars. All the earlier Miatas (up to 2005) have a computer programmed by the Japanese. No one so far has been able to "crack" the computer code to be able to alter the program to make the car perform better. But aftermarket companies have developed "add-on" computers that in some ways can override or replace the on-board computer to change the way the car runs and increase performance. However, if major changes to the engine are made or every last horsepower needs to be extracted from the engine, the OEM ECU will have to be replaced with a programmable one.

No one has been able to crack the encryption on the ECUs used in 1990 through 2005 Miatas. So when a modifying one of these cars with an aftermarket turbo kit or supercharger kit, the OEM ECU has to be replaced with a user programmable ECU or a secondary (or piggyback) ECU has to be added in conjunction with the OEM ECU. A programmable ECU does just as the name implies, it can be programmed to operate the engine regardless of the mechanical configuration. When properly set up, a Miata engine with a turbo kit can make double or triple the stock power.

Once you buy the aftermarket Add-On or Replacement computer, you then need a professional tuner to set it up to get the best performance out of the motor. We are lucky to have a previous employee of "Flyin' Miata", Ken Hill Jr., in our club who is very proficient at this. He does this working with a local performance shop and will be very happy to work with you to increase the performance of your NA and NB Miatas (Years up to 2005). Ken is proficient at working with several types of aftermarket computers which include the "Hydra" ECU that can be purchased thru "Flyin' Miata", or the "AEM" ECU which can be purchased thru "AEM Power". If you have any further questions, Ken can be reached at: ken@oracletuning.net

Below are examples of the Hydra and AEM aftermarket ECUs:



The NC Miata, 2006 and newer, has a computer that has been affected by Mazda's association with Ford Motor Co. Because of this association there are several USA Tuning Companies who have been able to "crack" the code, and make changes in the computer itself.

We are lucky to have a NC (2006+) Tuner right here in Eastern PA, up in the Lehigh Valley. The Company is named Moto-East. Mike Mann is the tuner and company owner. He can create a custom tune for your factory stock Miata, as well as a highly modified Miata. He has it simplified to where you can do this right at your home!

First you rent from him an electronic unit called a "Data-Logger". You plug this into your OBD II port down near your left foot. You drive the car for a little while, and this records the settings and performance of the computer program. Then you e-mail the data file it creates to Mike. Next you buy the "Tune Interface" which also includes the cost of creating your custom tune. Mike takes your data file, and creates a custom tune just for your car. He e-mails it back to you, and then you install it in your car using the Tune Interface you bought. Mike can then make changes to fine tune the settings if needed, or at any time you can return it to factory settings.

Things have been found that Mazda did to INHIBIT performance in 1st or 2nd gears so as to not have trouble with people new to rear wheel drive, or being hard on the gearbox during the warranty period. Mike states there is no additional danger to the motor to change this since you can already get full throttle in the other gears. The theory is either because the RWD is easier to spin tires in low gears, or they are trying to protect the transmission. Mike thinks it is the former since the gearboxes on these cars are incredibly strong. Moto-East has been able to override this so give us performance buffs more power in the 1st 2 gears. They can increase the timing to give more power in the mid range of the motor, right where we use it the most around town. They can change the air to fuel mixture to give the optimum mix for the current engine conditions at any given time. Basically they can add about 10 horsepower (6%) to a fully stock motor. I have also read where a custom tune can add up to 25 horsepower to a car with headers, mid pipe, and performance muffler.

Below are pictures of the Data-Logger (Left), and the Moto-East Tuning Interface:



Here is a quote from a forum poster on Miata.net. His post stated that his car was factory stock, and he just wanted a little more performance. His words say it better than I could.

"I Installed a Moto-East tune about a week ago. My opinion so far is quite favorable. The engine simply seems more alive and ready to go! I definitely notice the extra torque after shifts now however, as well as more torque in general pulling through the full RPM range.

My car is a Daily Driver and I did not want to get too radical with the tune so Mike set me up with a "milder tune". The throttle response is sharper, engine more responsive and runs smoother overall as well. For anyone considering this I would highly recommend it. Easily 2X the fun factor of my RoadsterSport Q (muffler) change." (Miata.Net, Pittsburg, PA)

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So Zoom-Zoom, with a Custom Tune!
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