



*Helpful Pre-Start Setup Tips for **GEN7** & **THRUSTER EFI***

The following steps were designed to be a guide to help you in the beginning stages of your DFI tuning career. Use this as an outline only. It is not all inclusive. As a tuner you are similar to the conductor of an orchestra. Through knowledge and experience you will need to determine how and when to alter these procedures to suit the engine you are working on.

Never forget that the calibration can not make up for mechanical problems with the engine, fuel or ignition system. Always use the SAT logic which represents: Stop and Think. If you add and subtract fuel and ignition timing and the problem is still present, then put the PC away because it is not a calibration issue. Many very good tuners have fallen prey to vacuum leaks, poor injector atomization, burned spark plug wires, and worn distributor gears. As good as the DFI system is, it can not make up for these and other problems.

The following steps assume that the ECU and wiring harness has been installed and are functional. The Engine Status Monitor is an excellent table to use as a scanner to quickly check things over.

At this point the engine is not running yet. The ignition should be on and the engine off.

Installing a Program.

- A)** Connect the Laptop to the DFI Com Cable. Click on the GEN 7 or THRUSTER ICON on the desktop and when the program comes on, click Online to ECM.

If you are not familiar with inputting your own program, use the vast selection in the Plug & Play menu to pick a program that is close enough to your engine combo. This will get you 75% of the way there.

- B)** To do the hit **F7** Key after you click on Online to ECM. Open the Folder marked PLUG & PLAY, go through the programs and pick the one you want, double click on it and wait for it to be downloaded in the ECM. **(During the download, do not interrupt the ignition, attempt starting the engine or attempt to run any other program in the laptop).**
- C)** After the program finished downloading, turn ignition key off for 15 seconds than back on again. Now you are ready to configure your set up.

Please use the next 9 Steps to configure the program for your engine combination. Under Configuration Select

1) Systems screen: Fill in all the information in this table. Remember: All eight places must be used for the injector firing order; the compression ratio data is used for altitude compensation and needs to be inputted; set the injector flow rate at manufacturers rated specs which is taken at 3 Bar or 43.5PSI, that is what 99% of the manufacturers rate their injectors flow rate at. Input the fuel pressure that you will be running with no vacuum on the regulator; you can set the TPS high and low points but these values will need to be revisited after the engine is running and the timing, idle speed, and air bypass (IAC) are set.

2) Controls screen: Input values that you feel will be appropriate for the engine. You may need to go back and change them as the calibration comes together.

3) Scale both the rpm and load for the engine. To change the load scaler you must re-enter the Systems screen and enable the scaled MAP axis. To change rpm cells this switch is not required. Remember that all tables with the same format will share the scaler settings. (Rescaling load is only necessary when the engine has low vacuum at idle).

4) Go to **Output Options** screen: Input values that you feel will be appropriate for the output controls. You may need to go back and change them as the calibration comes together.

5) Hit **F4 key**, Check the Target A/F matrix values and make sure that you feel they will be appropriate for the engine. (**Remember that as camshaft overlap is increased, the engine will require a richer mixture at idle**).

6) Hit **F3 Key**; Check the ignition timing table and make sure that it is appropriate for the engine.

7) F2 Key Base VE: If the VE Predictor was used then just visually check the values to see if they are in the "ball park". If the VE Predictor was not used then the following values can be inputted:

Idle	-	.400
WOT	-	.600-.800 for a street car
		.900-1.02 for a mild street car
		1.04-1.08 for a hot street car

Blend the values using the PC keyboard so there is a smooth transition between idle and WOT. Starting at WOT each row going toward idle should diminish by approximately .010 to .020. THIS IS ONLY A GUIDELINE! The 3D screen is a great way to blend maps.

8) Enter the Engine Status Monitor again and make sure the settings are correct. For example, the nitrous is not turned on.

9) Under Ignition Idle Spark; Zero the idle spark function, Save the table before you zero it by clicking on File than click on (Save Current Screen Data To A File) Reload the Idle Spark Table after you have dialed in the Spark map.

STARTING THE ENGINE

A) Set the base timing using the Forced Timing function. Adjust the distributor / crank trigger to sync the engine to the ECM. Then adjust the ignition delay in microseconds in the Engine Configuration Editor to confirm forced timing at one-half the engines maximum operating rpm. If the engine is going to be spun to 6,000 rpm, then adjust the ignition delay at 3,000 rpm.

B) Set the throttle blade angle for approximately 5 to 8-percent bypass air (Actual IAC Position, found in lower right-hand side of Target Idle Speed Screen). Opening the throttle plate will lower IAC position and closing the throttle plate will raise IAC position. Readjust the TPS low setting when done.

C) Work from idle to part-throttle no-load (free rev the engine); than idle load and up to full throttle and load.

Important tips to remember:

1) Your goal is to modify the VE table to achieve the mixture in the Target A/F table. **(Must have Wide Band O2 for tuning).**

2) Once the VE table is calibrated to create the Target A/F then work the desired mixture for the best power and drive-ability.

3) Use the Idle Spark function as an aid, not a crutch.

4) Constantly work between the Target A/F, Base VE, and Ignition timing tables. **DO NOT BE A ONE DIMENSIONAL TUNER!**

5) Use a feed-forward not a feed-back logic.

6) TAU versus MAP/ECT table (Transient Fueling): As the numbers in the TAU versus MAP/ECT table go lower more fuel is added to maintain the puddle. The values should always count down from the top to the bottom. They will be large on the top and must go down in descending order. A typical idle number will be approximately 80-85 descending down to 30-40 at WOT.

7) If possible always try to run in SEFI mode for better injector control and fuel rail hydraulics. If no cam sensor input is available the system will enter random

sequential mode, choosing a different cylinder as number one on each restart. Use the software to shut off the cam sensor input trouble code.

8) The DFI is a **V/E (Volumetric efficiency)** based ECU. It is not a look-up table. Feed it the wrong information and it will make the wrong calculations.

9) Always scale both the load and rpm for the maximum tuning set points in the operating range the engine will see the most.

10) Use functions such as Idle Start-Up Term to make the vehicle more drive-able. With the DFI 7.0 you do not need to choose between horsepower and driveability. You can have both! For steady state tuning you can use the Auto Cal function in the Base VE table.

11) GEN 7 Only The intake surface temperature sensor should be placed as close to the intake valve as possible and needs to touch the manifold runner for an accurate reading. The Intake Port Temperature reading on the instrument/dashboard screen is a calculated reading from intake surface, air charge, and coolant readings.

12) Make a habit of visiting the www.accel-dfi.com website to download the latest version of the software. Always try to have the customer invest in the latest firmware update.

13) Learn your product. You can not sell something that you do not understand or are not enthusiastic about!

14) Use all of the resources that ACCEL DFI provides to become successful!

Happy Tuning