

WinTEC3 Engine Management Software



WinTEC3 v3.0.0 Software User's Guide

Contents

Working With The WinTEC3 3.0.0 Engine Tuning Software.....	4
System Requirements.....	4
TEC 3 Firmware WT300T3	4
WinTEC3 Software	4
Windows 95 Edition 1	4
WinTEC3 Software user's Guide	4
DeskTop and Main Menu	5
Running the WinTEC3 Engine Tuning Software.	6
Introduction	6
WinTEC2 and WinTEC3 Differences	6
Communications Port Selection.....	6
New WinTEC3 Information	7
Main Menu	7
Calibration Screen	8
'ONFLY' Verses 'NO CONNECTION' Modes.....	8
Using ONFLY	9
Using the WinTEC3 WIZARD & BASIC INJECTOR FUEL PARAMETERS	9
WinTEC3 WIZARD & BASIC INJECTOR FUEL PARAMETERS	10
'A LEAN FUEL MIXTURE CAN KILL AN ENGINE'.....	10
Advanced Engine Setup.....	11
Tach Setup.....	11
MAP Conversion Type.....	11
Cam and Crank Sensor Type	11
TDC Setup.....	11
Ignition Advance Table.....	11
Ignition Advance Interactive 3D Graph.....	13
MAT Density Advance/Retard	14
Dual Plug Timing Split.....	14
Volumetric Efficiency Table	15
Volumetric Efficiency Table Interactive 3D Graph.....	16
Volumetric Efficiency Table Corrected Injector PulseWidth.....	17
Volumetric Efficiency Table Calculated Duty Cycle.....	18
EGO Air/Fuel Ratio Table	19
EGO Air/Fuel Ratio Table Interactive 3D Graph	20
EGO Parameters	20
EGO Sensor Calibration	21
Idle Speed Control	22
Idle Advance.....	22
Rev Limiter	23
Fuel Enrichment Screen.....	23
TPS/MAP Blend.....	23
TPS/MAP Acceleration	24
Deceleration Fuel Cut-off	25
TPS/MAP Acceleration	25
Battery Voltage Compensation.....	26
MAT Fuel Enrichment.....	26
Starting Enrichments.....	26
Warm-up Enrichments	27
OverBoost Fuel Cutoff	28

GPO Control	28
4 GPO's	28
Full GPO Control Table	29
GPO Control Interactive 3D Graph	30
GPO AC Control	30
GPO Aux Fuel Pump Control	31
GPO Fan Thermo Control	31
GPO Intake Runner Control	31
GPO NOS Control	32
GPO Shift Light Control	32
GPO Torque Converter Control	33
Analog/Digital and Datalog Inputs.....	33
Knock Control	34
Sensor Parameters	34
Coolant Sensor.....	35
MAT Sensor	35
Map Sensor.....	35
EGO Sensor	36
TPS Sensor	36
Software Diagram	37
Monitor Engine Functions.....	37
Analog Engine Monitor Screen (Default).....	38
Digital Engine Monitor Screen (ONFLY Mode).....	38
Digital Engine Monitor Screen and the Task Bar.....	39
Program TEC.....	39
Auto Calibrate VE Table	40
Create a Datalog File	41
View a Datalog File	41
Trace Graphs	42
Multi Graph Overlay.....	42
Keyboard Commands	42
Options	43
DEFAULT SCREEN SETTINGS:.....	43
Software Tools	43
Calculator	43
Memo Pad.....	44
View Software User's Guide.....	44
Print Calibration File	44
Interrogate BIN File	45
To Print Out a Graphics Screen.....	45
Downloading Data Into Other Spreadsheets.....	45
Installing a WinTEC3 Icon On the DeskTop.....	46
Display Files and DOS Access	46
Exiting WinTEC3	46

Working With The WinTEC3 3.0.0 Engine Tuning Software

System Requirements

The Electromotive WinTEC3 3.X.X Engine Tuning Software for the TEC3 requires a Pentium Class, 233 MHz or faster PC running Microsoft Windows 95/98 or Windows NT 4.0 (with service pack 3 or better) Operating system. The computer should be a Laptop with a Mouse or other pointing device recommended, but NOT required. A Minimum of a 3.5" disk, CD drive and Hard Disk drive for data storage is required with at least 64 megabytes of RAM memory, 128 megabytes recommended. The system also requires one IBM compatible serial port configured as Com 1, Com 2, Com 3 or Com 4 at 38400 baud or a USB interface (a KeySpan USB PDA Serial Adapter will work fine) and a display resolution of at least 800 x 600 x 256 colors. 1024 x 768 x 24 bit Color is recommended. For Maximum display usage we recommend 1280 x 1024 x 24 bit color. We also recommend that you use "Windows Standard" Appearance Scheme from Display Properties. This will give the user the best contrast and appearance for viewing WinTEC3 Monitor Screens.

TEC 3 Firmware WT300T3

With the release of the New TEC3 hardware, the TEC3 on longer uses Proms as the means of storing the primary executable Firmware program. The TEC3 now has Flash Ram for program storage, which means that if a problem occurs with the program it can be upgraded in the field in a matter of seconds. No need to wait days for a new prom or have to install those little legs in those little holes. Upgrades can be downloaded from the Internet in seconds and loaded to the TEC3 with the whole process taking less than 5 minutes.

WinTEC3 Software

BEFORE YOU INSTALL YOUR WinTEC3 PROGRAM, REMOVE ANY OTHER WinTEC3 INSTALLED PRODUCTS. USE THE WINDOWS "ADD/REMOVE PROGRAMS" FEATURE UNDER THE CONTROL PANEL TO REMOVE ANY INSTALLED WinTEC3 SOFTWARE.

The new software in your kit will be in the form of 4 floppy disks (optional) or 1 Cdrom. This software should be installed using the Windows 95/98/NT Installation Procedures. If this is your first WinTEC3 product, Go to "START", select "RUN", and type "A:SETUP.EXE" for floppy installation or type cdrom drive letter "x\ SETUP.EXE". This cdrom version also has the auto-run feature enabled. The WinTEC3 Installation program will help you to complete the installation.

Windows 95 Edition 1

With some Win95 Installations, it may be necessary to install WinTEC3 and then reinstall it after WinTEC3 has updated your OS with a new library that the manufacturer may not have included.

WinTEC3 Software user's Guide

A text version of this WinTEC3 Software User's Guide is included in the same directory as the WinTEC3 software. The text User's Guide is in MS Word format, which is available on Win95/98 and WinNT Operating Systems. The TXT version can be viewed using any standard Windows editor. The TXT file can also be viewed from inside the WinTEC3 software by selecting "**Software Tools**" and then selecting "**View Software User's Guide**".

DeskTop and Main Menu.



As you can see from the screen above the Desktop and Main Menu have several sections that you must be aware of before you start the Tuning process. The Current version number is on the desktop and Main menu in the upper left hand corner of each screen. The currently Open 'BIN' filename is also at the top of the Desktop. Just below that you see the WinTEC3 Tool Bar. This Tool Bar gives you instant access to the major sections of the program and also provides access to sections like Interrogate BIN File, Dataports, Problem Reporting and Tip of the Day information. At the bottom of the Desktop screen you will find the System Status bars, which lets the Tuner know what Hot Keys are available and the current Dataport being used. At the very bottom of the screen is the Task Bar which gives the user the access to other programs and helps to track the screens used by WinTEC3. If the "Show TaskBar" and "Hide TaskBar" buttons are visible, you are using a Laptop with 800x600 screen resolution. These buttons can turn the Task Bar On and Off according to your needs.

On the Main Menu you will find a selection of Program Buttons that can be activated by clicking the Icon or Program Bar with the Mouse pointer or by moving too each button by pressing the TAB key. When a program button is highlighted you can press the Enter key on the keyboard and that part of the program will be activated. Using the Keyboard and pressing the ALT key and the underlined Character key at the same time will also activate these program buttons.

Running the WinTEC3 Engine Tuning Software.

Introduction

When you RUN the WinTEC3 Engine Tuning Software for the first time, you will see a brief product information screen and then a Software License Agreement will appear. You must Read and Accept this Agreement before you can use the Calibration software. To continue, Read the Agreement and then Press the **ACCEPT** button. If you enter ACCEPT, the screen will not be displayed again. If selected, the Next screen to appear will be the "Tip of the Day" screen, and then the "Main Menu" screen. The "Tip of the Day" screen maybe disabled in the Tools Menu by clicking on the "Tip of the Day" Selection button or by deselecting the "Show Tips at Startup" box, on the Tip of the Day screen. A check mark means that it will appear at every startup of the WinTEC3 program. The "Tip of the Day" screen gives valuable information about WinTEC3 and engine tuning in general. Take a little time and read each one. If you have a Tip you would like to share with others, send it to us and we will include it in the next update of WinTEC3 based on its valuable to other tuners.

Now is a good time to become familiar with Windows 95/98/NT. To Minimize the WinTEC3 program, click on the underline '_' button in the upper right hand corner of the display. This will create an Icon in the taskbar on your PC and WinTEC3 will minimize it self, usually at the bottom of the screen. It is very important that you become familiar with your Windows environment. There have been may changes to the WinTEC3 program structure so it is suggested that you go through each of the windows and familiarize yourself with the location of the old data and what is now available as new input data.

WinTEC2 and WinTEC3 Differences

WinTEC2 worked on the principle that the User must engage ONFLY when needed. Now ONFLY is available whenever the TEC3 and Wintec3 Software are turned on. If the TEC3 is turned off then the system is in "NO CONNECTION MODE" and when TEC3 is turned On then the system is in "ONFLY MODE" (see Operating Modes above). WinTEC2 had 4 - 8x8 programmable data tables. The New WinTEC3 software has 6 - 16x16 programmable data tables that can be setup in any format from 8x8 up to 16x16 (i.e. 8x16, 13x9 etc.). These tables also highlight the current RPM and KPA active cell while the Engine is running and can make the cells a persistent color so that the tuner can view in real time which cells are bring hit as a result of the test run. We have added more GPO's , you can control functions using Analog and Digital inputs, you can trim Ignition and fuel values for each cylinder and do Onboard Data logging up to 100 samples per second. There are many new features that we could talk about here but just sit down and Read the Hardware and Software manuals and work your way through the new and expanded features of WinTEC3 and get familiar with its operation. This time will be well spent preparing for the first tuning session, so that you won't waste time with tech calls. If you do have problems, just call Electromotive Inc. at (703) 331-0100 and our knowledgeable Tech staff will work hard to get you up and running.

Communications Port Selection

The WinTEC3 software allows you to toggle between 'Com 1', 'Com 2', 'Com 3' or 'Com 4' by simultaneously holding down 'Ctrl' and 'P' just like the old DOS calibration software or by clicking on the "Communication" Menu option on the Main screen Tool Bar and highlighting the "Data ports" option then choosing the DataCom port you need. The current Baud rate is 38400 bps on the COM ports. If your system does not have COM ports you can use a USB interface with a KeySpan USB PDA Serial Adapter and set it up as a COM Port. Most of the New Laptops come with both types and some have a USB Port only. Check your current port selection in the Status Bar at the bottom of the WinTEC3 Window, if any communication problems arise. At this point, TEC3 should be completely installed, including the communications cable.

Start the WinTEC3 software with the supplied calibration [87octane.bin] or use a BIN file from a previous tuning session, (WinTEC3 Converts older "BIN" files to the New WinTEC3 style "BIN" files). At this point we should **STOP** and let you know that the old "**S19**" files and the old "**DAT**" files **WILL NOT WORK WITH WinTEC3**. You can use the old "BIN" files but you must update the data with New information and save the "BIN" file to a new name, which will create a new "S19" file of the same file name.

New WinTEC3 Information

The Old WinTEC2 software, as we have already talked about, used only 8x8 tables and now may use up to 16x16 tables, we have added Engine Configurations for 34 different types of engines, Advanced Engine settings like different Tach types, Cam or Crank Sensors and Trigger Wheel Offsets. We now have Over Boost protection for the Turbo and supercharged engines built into the software configuration, and even things like Valet mode and Speed sensor inputs. When you convert an Old BIN file to the new WinTEC3 format, all of these things must be address before saving the New BIN file.

Main Menu



For the most part, the WinTEC3 program user interface is similar to the WinTEC2 user interface with a few changes. The Main Menu has most of the same selections as WinTEC2 and a few extras. We will explain each of the selections as we continue with this guide. Other familiar inputs are, when you enter a new piece of data, you must "PRESS ENTER" to save a new or changed value. When you want to change data fields within a Local Window, Look for the Underlined Character or Number and press 'ALT + Char/Num' Hot Keys to move to that field. You can also use the TAB key, as explained above, to move the cursor to the next field. The system will not allow you to move from a field that has been changed without pressing the 'ENTER' key. You can use the ALT+TAB keys to change focus from one window to another and one program to another.

You can also make changes within the Global Window by pressing the 'CTRL + Character' Hot Keys to activate global functions. Currently the global hot keys include:

CTRL + P = Toggle Com Ports (Com1 to Com2 to Com3 or Com4)

CTRL + Z = Turn off the Engine, Send BIN file Program to the TEC, Save the current 'BIN/S19' file to Disk and send a command to the TEC to Move RAM to FLASH RAM.

CTRL + M = Display the Analog Monitor Screen.

CTRL + S = Save the current 'BIN' file to Disk and send a command to the TEC to Move RAM to FLASH RAM if the System is in ONFLY Mode.

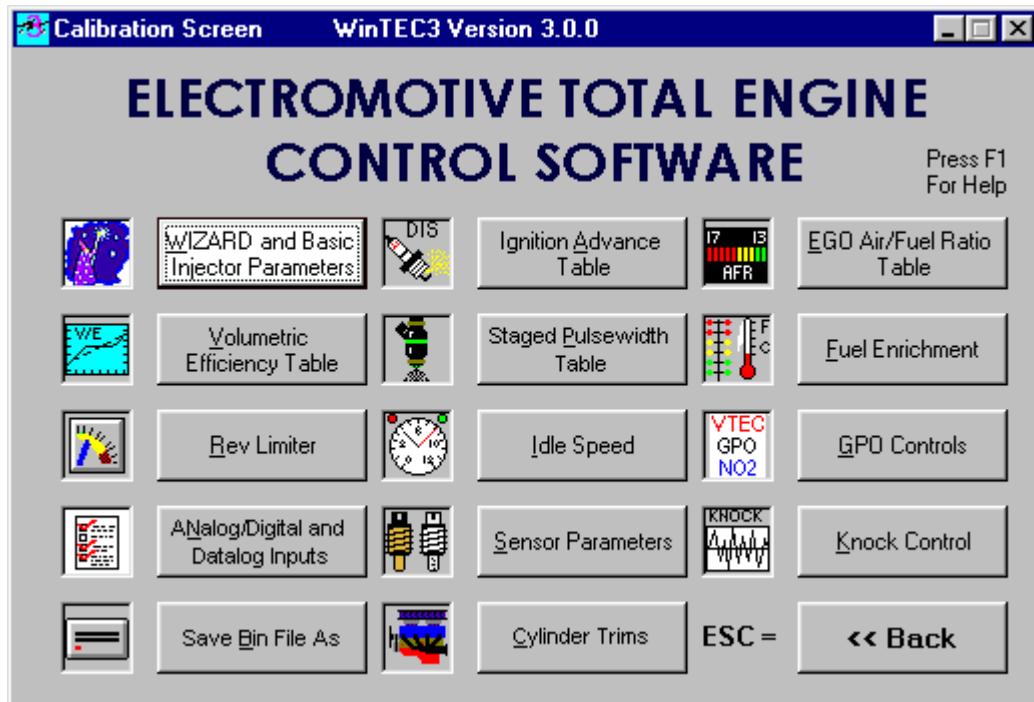
CTRL + X = Exit Program.

Of course the major difference is that you can use a mouse pointer and mouse button click to activate any part of the WinTEC3 program. There are some sections that will require some keyboard interaction and conversely the WinTEC3 program does not require any mouse interaction at all to get the job done.

Calibration Screen

When you press the “Edit a Calibration File” button from the Main Menu, if no calibration ‘BIN’ file has been selected, WinTEC3 will ask you to enter a valid ‘BIN’ file name. You may enter a filename or if a file is already loaded then you may use that file by pressing the “Cancel” button. If a ‘BIN’ file has already been loaded into the system and you select a new ‘BIN’ file, the user will be asked to ‘SAVE’ the old ‘BIN’ file and then load the new one.

When a valid “BIN” file is loaded, the “Edit a Calibration File” window is displayed with the following Options:



‘ONFLY’ Verses ‘NO CONNECTION’ Modes

ONFLY Mode is Always ON and is now the Standard Operating environment that the tuner uses to build an Engine Control BIN file. As the values are entered, they are updated in both the PC and the TEC3 Simultaneously. You must still save the BIN file to disk by using the ‘Save BIN File As’ program button or typing Control-Z while editing a data screen. Saving the BIN file also sends a command to the TEC Unit to move All the current Data from RAM to FLASH RAM where the data cannot be changed until the Next Save command is sent.

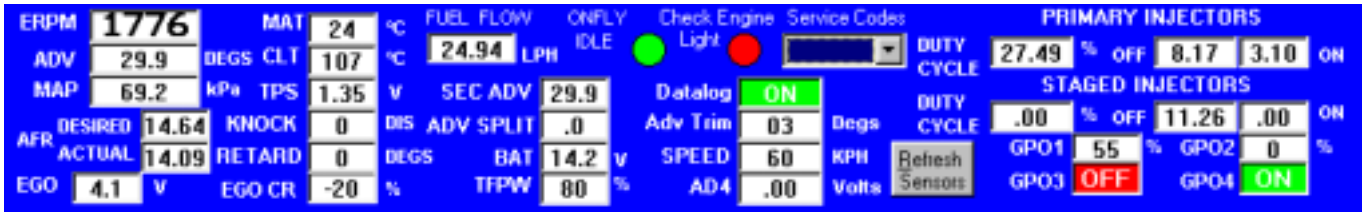
If the TEC3 is turned off or the Serial cable is disconnected from the Computer then the WinTEC3 software is in NO CONNECTION Mode. There are many changes that can only be made while you are in the NO CONNECTION such as EGO Calibration values, Row and Column Table size changes and Engine Configuration changes among others. After these changes are made in NO CONNECTION Mode, you must Save the BIN file and then download it to make the changes to the TEC Unit.



DIGITAL MONITOR IN NO CONNECTION MODE

Using ONFLY

When ONFLY Real Time Editing mode is active, each field that has a light yellow background is available to ONFLY. Pick a field to edit and change that field to a new value while the engine is running. You will notice that a Red light on the Digital Monitor Screen goes on when you press Enter. This is telling you that ONFLY is sending the new value to the TEC Unit and to please wait until the light turns green before entering another value. If the TEC has a problem with saving the new value it will let WinTEC3 know and you will see a message that prompts you to resend the value again. After you make a change, both the TEC and the PC are updated to the new values. At this point the BIN file must be saved and downloaded to the TEC so that you have a current record of the file and the TEC Data. This is not absolutely necessary but it is a real good idea to save it so you don't lose your data.



DIGITAL MONITOR

Using the WinTEC3 WIZARD & BASIC INJECTOR FUEL PARAMETERS

Before we start working with the WinTEC3 Wizard and Injector Parameters, let's bring up the Analog Engine Monitor Screen by typing CTRL-M and correct any condition causing a sensor to show 'Failed' and begin to record such information as closed throttle voltage as you did with other versions of the WinTEC and DOS software. We will go into greater detail about the Engine Monitor Screens a little later. Also, if you are converting an older "BIN" file, you may have to update certain tables and parameters that the old software did not have.

WinTEC3 Wizard and Basic Injector Fuel Parameters is an integration of the WinTEC2 Tuning Wizard and the Basic Injector Parameters forms. This New form makes the process of creating a New BIN file a little easier for the beginner and the veteran tuner as well. Many of these values were previously calculated by hand and you still must gather some data like Engine type, number of injectors, Max RPM etc. When you have completed the data entry, Press the WIZARD BUTTON and a basic Engine control BIN file will be created for you. This BIN file will get the engine running so that all of the other functions can be setup with new values.

WinTEC3 WIZARD & BASIC INJECTOR FUEL PARAMETERS

Each of these Parameters can be calculated for a new vehicle using 'Base.Bin' or recalculate parameters using an existing vehicle bin file. As you move from one field to another, use the F1 Help key to make it easier for you to understand what needs to be entered into each of the fields. To calculate a new set of parameters you will need to know:

- Engine Type (2/4 Stroke, etc)
- Number of cylinders
- Number of Injectors
- TPS Voltage at Wide Open Throttle
- Map Bar Value (1 to 4 BAR)
- Max Boost Pressure
- Type of Induction used
- Max Engine RPM
- Estimated Brake Horsepower
- The type of Cam being used

The best way to prevent engine damage is to use exhaust gas temperature (EGT) probes. The maximum allowable EGT is determined by the type of fuel used and valve material (assuming no spark knock). If spark knock is heard, BACK OFF IMMEDIATELY! Reduce ignition advance or richen the fuel mixture to lessen the possibility of knock.

'A LEAN FUEL MIXTURE CAN KILL AN ENGINE'

After all of the data has been entered into the Wizard & Basic Injector Fuel Parameters Window, the Wizard will calculate a Fuel Injector Flow Rate for 1 injector. This value will become the minimum injector size that can be entered in this field. At this point you must enter the size of injectors that you are currently using on your engine or the injector size that you will be using. When the injector size is entered, you will be asked to press the Wizard button to create a new 'BIN' file. You must save the new 'BIN' file under a NEW NAME if you started with the 'Base.Bin' file or save it to the current 'BIN' filename. A 'BIN' file CANNOT be saved as 'Base.Bin'. Also remember that with Windows 98, the user can give a 'BIN' file a name that is very descriptive of the kind of vehicle that the TEC unit is installed in (i.e. Ford Mustang GT 1996.bin). When you finish saving the new 'BIN' file, you will be returned to the Main Menu.

Advanced Engine Setup

TACH SETUP
Change from Standard TACH Pulse Per Revolution (1 to 6) = Pulses

MAP CONVERSION TYPE
MAP Conversion for Old Style Or New Style = OLD NEW

CAM/CRANK SENSOR TYPE
Cam Sensor Type (Hall Effect/Magnetic) = MAG HALL
Crank Sensor Type (Hall Effect/Magnetic) = MAG HALL

TDC SETUP
Change DFU-A Trigger Wheel TDC (8 to 28 teeth) = Std Offset = Tooth 11
Change DFU-B Trigger Wheel TDC (8 to 28 teeth) = Odd Fire Only

Press F1 For Help
Esc =

Tach Setup

The tachometer output on the TEC³ is a +12 Volt square wave. Each time a coil fires, a “tach pulse” is generated. In the Standard Configuration a 4-cylinder will output 2 tach pulses per revolution, a 6-cylinder will output 3 tach pulses per revolution, an 8-cylinder will output 4 tach pulses per revolution, and a 12-cylinder will output 6 tach pulses per revolution. For applications that have a tachometer configured for a different number of cylinders than the engine (i.e. a 6-cylinder car that was converted to an 8-cylinder), you can use this option to change the tach output type under software control. For more Information see the “**Installation and Calibration Manual**”.

MAP Conversion Type

In the Old DOS and WinTEC Software, the 'OLD' Map for 2 BAR and 3 BAR Sensors was a Multiple of the 1 BAR Sensor value. In the 'NEW' Map, the Calculation for the 2 BAR and 3 BAR MAP Sensor's are Set to the Manufacture's Specifications. Using this NEW Map value will change the OLD VE Table Settings Edit a Calibration File. For New Engine Configurations use the New MAP Calibration.

Cam and Crank Sensor Type

The Cam and Crank Pulse Sensors can be either the standard Magnetic Pickup(Analog) Sensor or the Hall Effect (Digital) Type Sensor.(See the “**Installation and Calibration Manual**” for Details)

TDC Setup

ALL TEC3 systems should have the trigger wheel installed with the trailing edge of the 11th tooth when the #1 cylinder is at TDC. For situations where the crank sensor is NOT aligned with the 11th tooth at TDC, the 'TDC Setup Parameter' can be used to correct the timing. For applications that require more or less 'mechanical' timing, manipulate this parameter instead of moving the trigger wheel. (See the “**Installation and Calibration Manual**” for Details).

Ignition Advance Table

IGNITION ADVANCE TABLE

MAP (10 to 104 kPa) Press F1 For Help ONFLY Values have Yellow Background Main Ignition Advance (0 to 60) Deg. You Must Press Enter to Save Changed Values

104	18	18	18	18	18	18	18	18	18	19	18	22	24	26	28	30	32
98	18	18	18	18	18	18	18	18	18	19	18	22	24	26	28	30	32
92	18	18	18	18	18	18	18	18	18	19	18	22	24	26	28	30	32
86	18	18	18	18	18	18	18	18	18	19	18	22	24	26	28	30	32
80	18	18	18	18	18	18	18	18	18	19	18	22	24	26	28	30	32
74	18	18	18	18	18	18	18	18	18	19	18	22	24	26	28	30	32
68	20	20	20	20	20	20	20	20	20	22	22	24	26	28	30	32	
62	24	24	24	24	24	24	24	24	24	25	24	24	24	24	24	24	24
56	24	24	24	24	24	24	23	24	24	25	24	24	24	24	24	24	24
50	24	24	24	24	24	24	24	24	24	25	24	24	24	24	24	24	24
44	24	24	24	24	24	24	24	24	24	25	24	24	24	24	24	26	24
38	23	24	24	24	24	24	24	24	24	25	24	24	24	24	24	24	24
32	22	22	22	22	22	22	21	22	22	22	22	22	22	22	24	24	24
26	18	18	18	18	20	20	20	20	20	21	20	20	20	22	20	20	20
20	14	17	17	17	17	17	17	16	18	18	18	18	17	18	18	18	18
14	12	14	14	14	14	14	14	14	14	14	14	15	15	15	16	18	16

500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500 6000 6500 7000 7500 8000

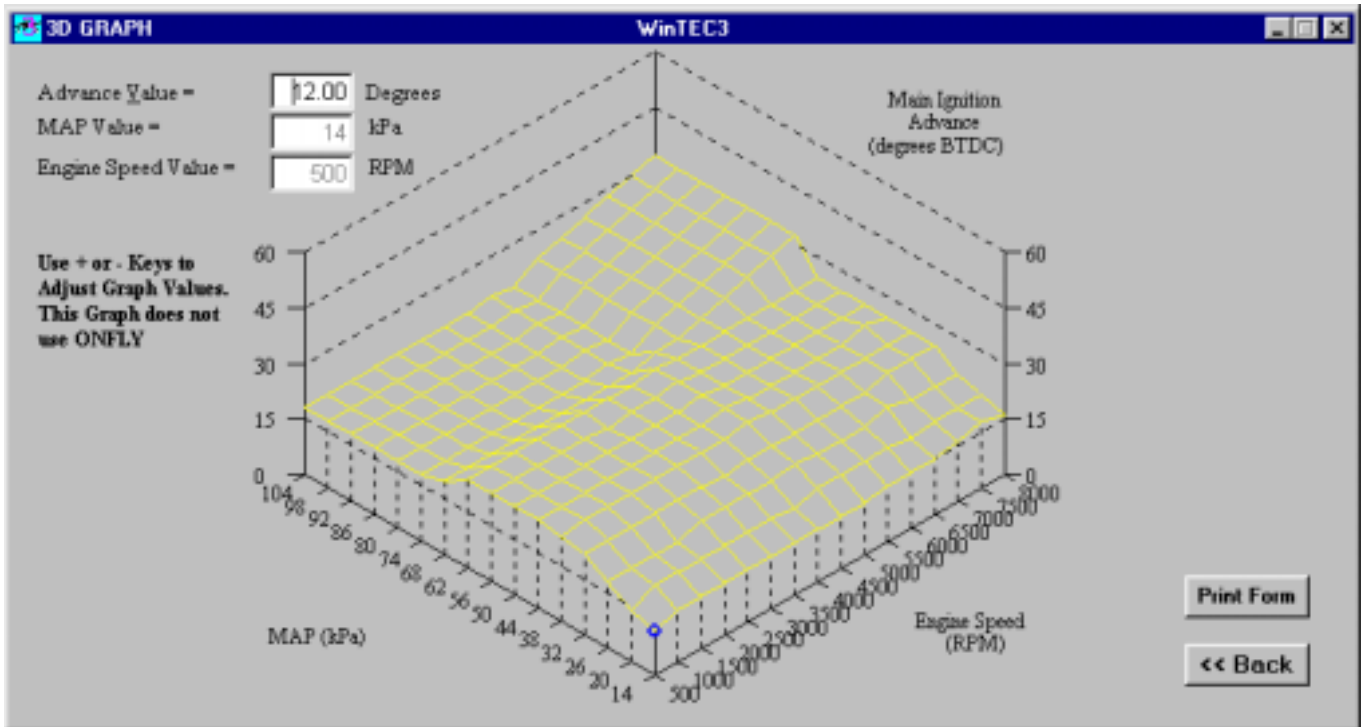
Press F3 to Edit Rows.
Press F4 to Edit Columns.
Type Alt S to Edit Full Table.
Type Alt U to Undo last Row, Column or Full Table Edit.

Main Advance Table Graph Engine Speed (RPM) Initial Adv (0 to 30) = 12 Coolant Advance Cell Color Persist if Checked

Print Form MAT Density Advance/Retard Dual Plug Timing Split << Back

The TEC3 uses a 16 x 16 Advance table where the Tuning Wizard or the tuner, defines the RPM and the MAP/kPa breakpoints. Set the RPM points that are to be used for your engines normal operating range (the Tuning Wizard will extrapolate a set of RPM points based on the MAX RPM). Note that the RPM values MUST be increasing in value from left to right. Select a MAP BAR # in the operating range of the MAP Sensor that is being used for this application (the Tuning Wizard will extrapolate a set of MAP points based on the MAP Sensor used). If other than a 1-bar MAP sensor is used, enter a new MAP BAR # and the MAP values range will change to reflect the use of the selected MAP sensor. These MAP/kPa values can be changed to suit your engines operating range. The Advance values are linearized between the RPM and MAP/kPa breakpoints. To the left or below the first RPM breakpoint, only the initial Advance is used. The Initial Advance should be equal to or less than the first RPM/kPa breakpoint Advance value. The exact same RPM & MAP/kPa breakpoints are used for the GPO, EGO and VE tables. The Advance values recorded in this table may not represent the actual Advance values since mechanical offset, Knock control, Coolant Advance and Idle control may change the actual timing. Each Advance table Cell can be edited by using the arrow keys to select the cell you want to edit or you can use F3 to edit a complete Row of data or F4 to edit a complete Column of data or you can type "S" and enter a Constant for the entire table. ONFLY can now update the Advance data and Initial Advance fields plus the RPM and MAP/kPa points while the engine is running. The Advance Table also displays the current RPM and Load point of the engine via light blue Hot Cell on the Table. These Hot Cells can also be persistent by checking the "Cell Color Persist" box. This will help to visualize the engine operating range as the power is produced.

Ignition Advance Interactive 3D Graph



All of the 3D graphs in WinTEC3 are interactive. You can move the blue oval cursor around the graph by using the arrow keys (see * 3D Graph Arrow Keys below) on the keyboard. Once you get to the point that you want to change, just press the + key or the - key to move the values up and down at that point. When you have reached the desired value, you can return to the Ignition Advance Table and you will see that the value at that point has been changed and is now the same as the 3D Graph. This will help the tuner to visualize the Ignition Table values and how they relate.

* 3D Graph Arrow Keys

Esc = Exit Graph

Up-Arrow = Move Up One Step

Down-Arrow = Move Down One Step

Right Arrow = Move Right One Step

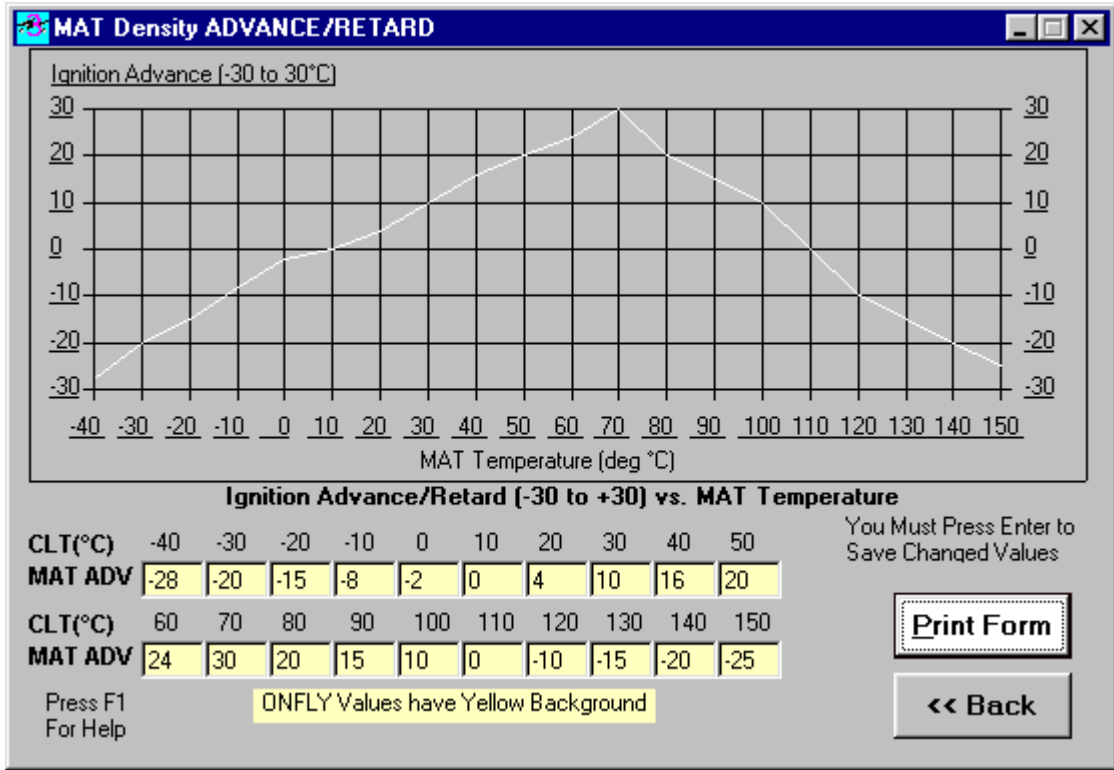
Left Arrow = Move Left One Step

Use the '+' Key to Add Value to Graph Point

Use the '-' Key to Subtract Value from the Graph Point

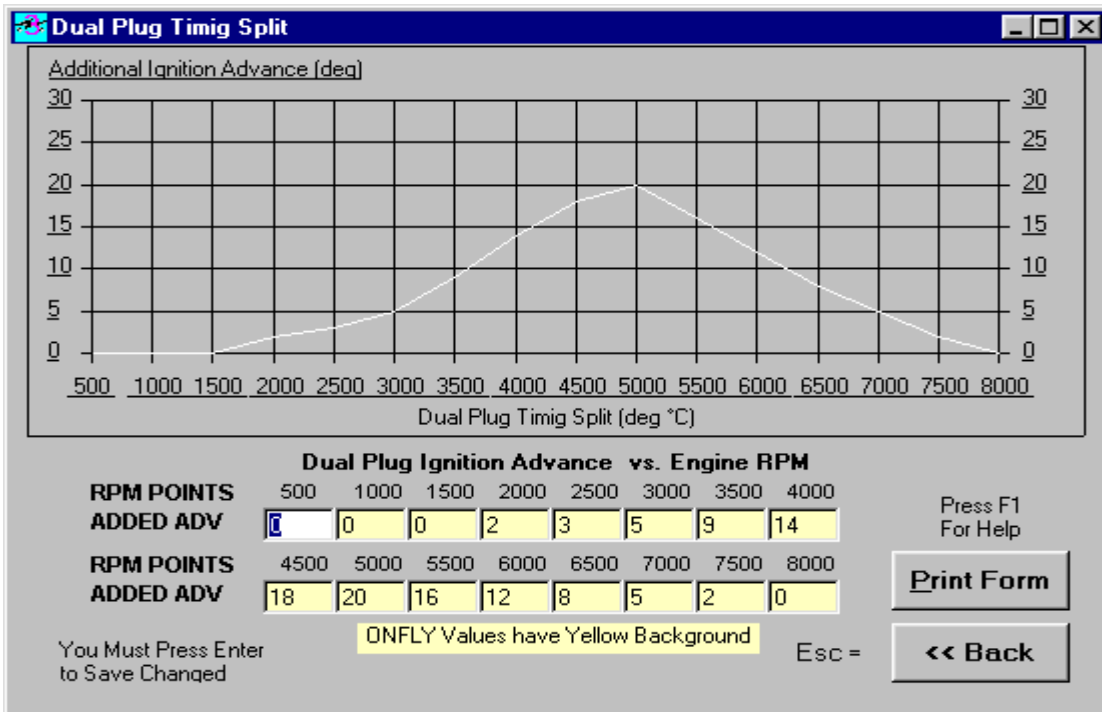
The Value for Each Step in the Graph is displayed in the Value Box

MAT Density Advance/Retard



In WinTEC2 the MAT Fuel Enrichment and Adv and Retard values were two single entries in the MAT/VOLTAGE COMPENSATION routine. Now the user has a complete scale from -40 to 150 degrees Celsius and can Advance or Retard from -30 to +30 degree of advance verses temperature.

Dual Plug Timing Split



In some applications like Rotary Engines where the trailing plug of a Dual plug setup requires that the trailing plug have a different Advance value, this table lets the user set a different Advance values at the same RPM spread values as the Main Advance table.

Volumetric Efficiency Table

VOLUMETRIC EFFICIENCY TABLE
F2 Switches from OFFSET to ABSOLUTE FPW

MAP
 (10 to 104 kPa)

Volumetric Efficiency Correction [-50% to 50% FPW]

OFFSET

104	1	10	18	22	26	30	28	34	36	38	40	46	48	50	47	47
98	0	6	10	18	26	28	28	33	34	35	36	40	48	48	46	43
92	0	0	6	10	22	26	28	32	32	32	37	44	45	46	41	38
86	0	0	0	8	18	24	28	26	28	28	30	36	44	44	39	35
80	0	0	0	4	12	22	28	27	28	27	28	31	40	42	36	30
74	0	0	0	0	10	20	28	24	26	26	26	28	38	40	34	32
68	0	0	0	0	6	23	28	25	25	25	26	29	38	38	36	31
62	20	19	18	20	22	24	28	27	27	28	29	34	37	35	32	32
56	23	22	23	22	23	21	28	29	27	24	26	28	30	32	26	28
50	24	24	26	25	25	23	28	28	25	24	24	25	25	26	23	26
44	27	27	26	25	26	25	28	26	26	26	25	26	29	29	26	26
38	28	27	26	26	26	26	28	26	27	28	26	28	30	32	29	26
32	22	24	24	25	25	25	30	30	31	31	30	31	31	32	30	28
26	16	17	17	17	17	17	28	35	33	33	33	33	33	33	33	30
20	17	19	20	21	22	23	28	28	26	24	26	28	30	32	32	26
14	18	20	22	23	23	22	23	22	22	22	21	22	23	24	26	25

500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000
-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

Engine Speed (RPM)
ONLY Values have Yellow Background

VE Table Graph

Print Form

Press F3 to Edit Rows.
 Press F4 to Edit Columns.
 Type Alt S to Edit Full Table.
 Type Alt U to Undo last Row,
 Column or Full Table Edit.

View FUEL Table

You Must Press Enter to
Save Changed Values

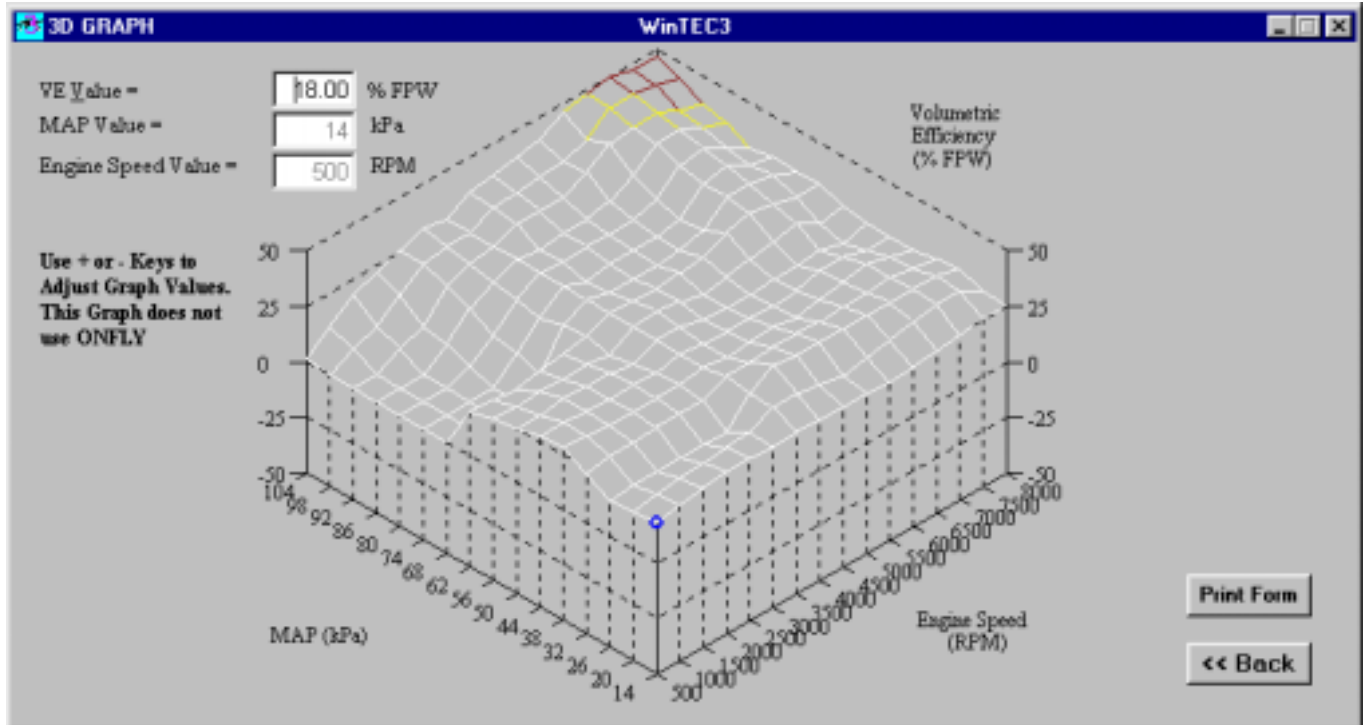
Press F1
For Help

ESC = << Back

Cell Color
 Persist if
 Checked

The TEC uses a 16 x 16 Volumetric Efficiency table where the RPM or MAP/kPa breakpoints are defined in the Advance table. The VE-table numbers represent plus or minus offsets from current GAMA value. While in the engine monitor mode, run the engine at a defined RPM or MAP/kPa and then manually use GAMA OFFSET to alter the fuel delivery. It is also possible to let the EGO Correction factor find the Desired Air/Fuel Ratio and then observe how far GAMA is from a perfect 1.00. Insert this offset into the VE table at the exact RPM or MAP/kPa point and continue this until all points are complete. The VE table is then linearized between these points and extrapolated beyond the defined RPM and MAP/kPa table ranges. All percentage values must be entered as whole numbers (i.e. 100 not 1.00). Each VE table Cell can be edited by using the arrow keys to select the cell you want to edit or you can use F3 to edit a complete Row of data or F4 to edit a complete Column of data or you can type "S" and enter a Constant value for the entire table. ONFLY can only update the Volumetric Efficiency data fields. RPM and MAP/kPa must be updated in the Advance Table in Edit mode and Downloaded using Program TEC from the Main Menu.

Volumetric Efficiency Table Interactive 3D Graph



With this interactive 3D Volumetric Efficiency graph, the user can move the blue oval cursor around the graph using the arrow keys (see * 3D Graph Arrow Keys above) on the keyboard. Once you get to the point you want to change, as defined in the fields in the upper left hand corner, just press the + key or the - key to move the values up and down at that point. When you have reached the desired value, you can return to the Volumetric Efficiency Table and you will see that the value at that point has been changed and is now the same as the 3D Graph. This will help the user to visualize the Volumetric Efficiency Table values and how they relate. Values in the VE Enhanced Fundamental PW Duty Cycle (%) Table and the VE Enhanced Fundamental Pulsewidth (ms) Table are not editable and this 3D Graph is not available while ONFLY is active.

Volumetric Efficiency Table Corrected Injector PulseWidth

VOLUMETRIC EFFICIENCY TABLE
_ □ ×

MAP
(10 to 104 kPa)

Volumetric Efficiency [Corrected Injector PulseWidth]

Enter Sample UAP = Enter Sample PDT =

This Table is Based
on OFFSET FPW and
is not Editable

104	6.36	6.93	7.43	7.69	7.94	8.19	8.06	8.44	8.57	8.69	8.82	9.2	9.32	9.45	9.26	9.26
98	5.88	6.23	6.47	6.94	7.41	7.53	7.53	7.82	7.88	7.94	8.0	8.23	8.7	8.7	8.58	8.41
92	5.46	5.46	5.79	6.01	6.66	6.88	6.99	7.21	7.21	7.21	7.48	7.86	7.92	7.97	7.7	7.53
86	5.04	5.04	5.04	5.44	5.95	6.25	6.45	6.35	6.45	6.45	6.55	6.85	7.26	7.26	7.01	6.8
80	4.62	4.62	4.62	4.8	5.17	5.64	5.91	5.87	5.91	5.87	5.91	6.05	6.47	6.56	6.28	6.01
74	4.2	4.2	4.2	4.2	4.62	5.04	5.38	5.21	5.29	5.29	5.29	5.38	5.8	5.88	5.63	5.54
68	3.78	3.78	3.78	3.78	4.01	4.65	4.84	4.73	4.73	4.73	4.76	4.88	5.22	5.22	5.14	4.95
62	4.03	4.0	3.96	4.03	4.1	4.17	4.3	4.27	4.27	4.3	4.33	4.5	4.6	4.54	4.44	4.44
56	3.62	3.59	3.62	3.59	3.62	3.56	3.76	3.79	3.73	3.65	3.7	3.76	3.82	3.88	3.7	3.76
50	3.12	3.12	3.18	3.15	3.15	3.1	3.23	3.23	3.15	3.12	3.12	3.15	3.15	3.18	3.1	3.18
44	2.67	2.67	2.65	2.63	2.65	2.63	2.69	2.65	2.65	2.65	2.63	2.65	2.71	2.71	2.65	2.65
38	2.15	2.13	2.12	2.12	2.12	2.12	2.15	2.12	2.13	2.15	2.12	2.15	2.18	2.22	2.17	2.12
32	1.54	1.56	1.56	1.58	1.58	1.58	1.64	1.64	1.65	1.65	1.64	1.65	1.65	1.66	1.64	1.61
26	0.97	0.98	0.98	0.98	0.98	0.98	1.08	1.13	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.09
20	0.49	0.5	0.5	0.51	0.51	0.52	0.54	0.54	0.53	0.52	0.53	0.54	0.55	0.55	0.55	0.53
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

500

1000

1500

2000

2500

3000

3500

4000

4500

5000

5500

6000

6500

7000

7500

8000

VE Table
Graph

Press F3 to Edit Rows.
Press F4 to Edit Columns.
Type Alt S to Edit Full Table.
Type Alt U to Undo last Row,
Column or Full Table Edit.

Engine Speed (RPM)

ONLY Values have Yellow Background

Press F1
For Help

Cell Color
Persist if
Checked

Print Form

View DUTY CYCLE Table

You Must Press Enter to
Save Changed Values

ESC = << Back

Volumetric Efficiency Table Calculated Duty Cycle

VOLUMETRIC EFFICIENCY TABLE
_ □ ×

MAP
(10 to 104 kPa)

Volumetric Efficiency [Calculated Duty Cycle (%)]

This Table is Based
on OFFSET FPW and
is not Editable

104	0	6	13	20	28	36	43	53	62	72	82	95	100	100	100	100
98	0	5	11	18	26	33	40	49	57	65	74	85	99	100	100	100
92	0	5	10	15	23	30	37	45	52	59	69	81	90	99	100	100
86	0	4	9	14	21	27	34	40	47	53	61	71	82	90	95	100
80	0	4	8	12	18	25	31	37	43	48	55	62	74	82	85	88
74	0	4	7	11	16	22	29	33	38	44	49	55	66	73	76	82
68	0	3	6	10	14	20	26	30	34	39	44	50	59	65	70	73
62	0	3	7	10	14	18	23	27	31	35	40	46	52	56	60	65
56	0	3	6	9	13	16	20	24	27	30	34	39	43	48	50	55
50	0	3	5	8	11	14	17	20	23	26	29	32	36	40	42	47
44	0	2	5	7	9	12	14	17	19	22	24	27	31	34	36	39
38	0	2	4	5	7	9	11	13	15	18	20	22	25	28	29	31
32	0	1	3	4	5	7	9	10	12	14	15	17	19	21	22	24
26	0	1	2	3	3	4	6	7	8	9	10	12	13	14	15	16
20	0	0	1	1	2	2	3	3	4	4	5	6	6	7	8	8
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

500100015002000250030003500400045005000550060006500700075008000

Engine Speed (RPM)

ONLY Values have Yellow Background

VE Table
Graph

Press F3 to Edit Rows.
Press F4 to Edit Columns.
Type Alt S to Edit Full Table.
Type Alt U to Undo last Row,
Column or Full Table Edit.

View VE Table

Press F1
For Help

Print Form

You Must Press Enter to
Save Changed Values

Cell Color
 Persist if
Checked

ESC = << Back

EGO Air/Fuel Ratio Table

EGO AIR/FUEL RATIO TABLE
_ □ ×

MAP
(10 to 104 kPa)

Desired Air/Fuel Ratio
(10:1 = Rich to 28:1 = Lean, 14.64 = Desired Air/Fuel Ratio)

You Must Press Enter to
Save Changed Values

104	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64
98	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64
92	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64
86	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64
80	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64
74	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64
68	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64
62	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64
56	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64
50	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64
44	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64
38	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64
32	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64
26	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64
20	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64
14	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64

Engine Speed (RPM)

ONLY Values have Yellow Background

Calibrate EGO
Sensor

Display A/F
Ratio Graph

Press F3 to Edit Rows.
Press F4 to Edit Columns.
Type Alt S to Edit Full Table.
Type Alt U to Undo last Row,
Column or Full Table Edit.

Print Form

Edit EGO
Parameters

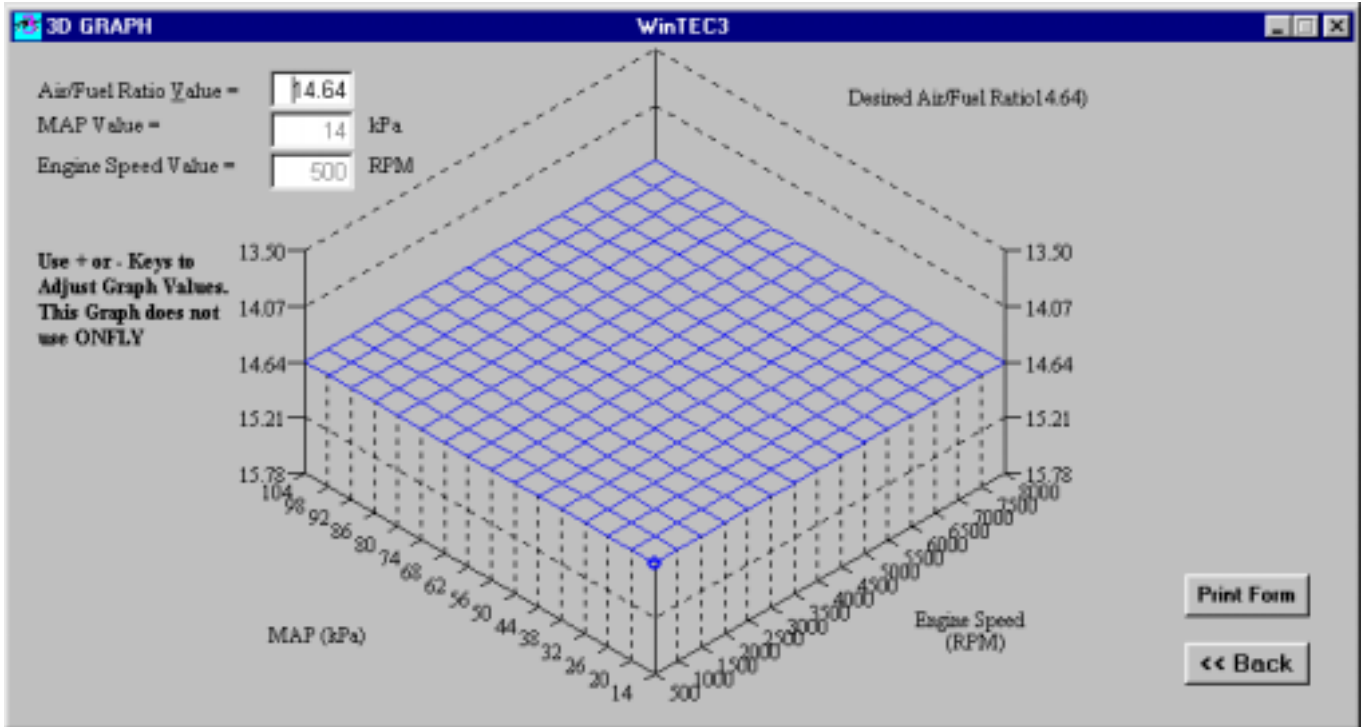
Press F1
For Help

Cell Color
 Persist if
Checked

<< Back

The Air Fuel Ratio feedback system uses a 16x16 table where the RPM and MAP/kPa breakpoints are defined in the Advance table. The desired air to fuel ratio can be typed in any one of the 256 cells. The TEC will straight line linearize between the points and extrapolate beyond the defined RPM or MAP/kPa values. The computed desired air to fuel ratio appears on the engine monitor screen "DESIRED AFR" next to the actual air fuel ratio "ACTUAL AFR". The TEC modifies fuel flow to get the actual to equal the desired. Each EGO table Cell can be edited by using the arrow keys to select the cell you want to edit or you can use F3 to edit a complete Row of data or F4 to edit a complete Column of data or you can type "S" and enter a Constant for the entire table. ONLY can only update the Air/Fuel Ratio data fields. The RPM and MAP/kPa fields must be updated through the Advance Table.

EGO Air/Fuel Ratio Table Interactive 3D Graph



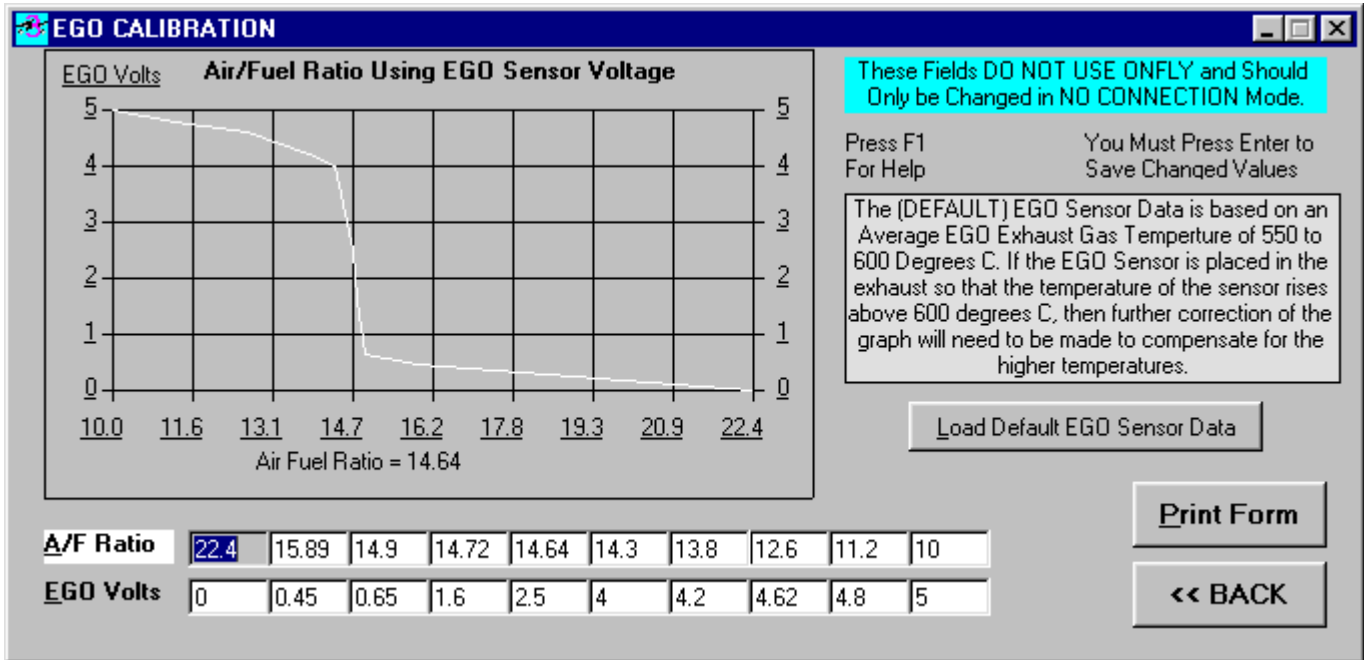
With the EGO interactive 3D graph, the user can move the blue oval cursor to any position on the graph by using the arrow keys (see * 3D Graph Arrow Keys above) on the keyboard. Once you get to the point you want to change, as defined in the fields in the upper left hand corner, just press the + key or the - key to move the values up and down at that point. When you have reached the desired value, you can return to the EGO Air/Fuel Ratio Table and you will see that the value at that point has been changed and is now the same as the 3D Graph. This will help the user to visualize the EGO Air/Fuel Ratio Table values and how they relate. This 3D Graph is not available while ONFLY is active.

EGO Parameters

The screenshot shows the "EGO PARAMETERS" configuration window. At the top, "EGO Feedback Control Activation" is set to "ON" (radio button selected). A yellow box contains the text "ONFLY Values have Yellow Background". Below this, the "EGO Reactivity and Authority" section includes: "Instantaneous AFR Error Divisor (Large Corr. <- 2,4,8,16,32,64 -> Small Corr.) = 32", "Number of Samplings for Average Error (Fast Corr. <- 2,4,8,16,32,64 -> Slow Corr.) = 16", "Number of Cylinder Events between EGO Samplings (1 to 12) = 8", and "Authority Range for EGO (0 to 50% Gamma) = 20 %". The "EGO Programmable Deactivation" section includes: "RPM above which High MAP SWITCH is Active (1000 to 11000 RPM) = 7800 RPM", "High MAP SWITCH above which EGO is Disable (10 to 104 kPa) = 102 kPa", "Coolant Temperature above which EGO is Enabled (0 to 80 C) = 60 °C", and "RPM below which EGO Sensor is Disabled (0 to 11000 RPM) = 1000 RPM". On the right side, there are "Print Form" and "<< Back" buttons. A note says "Press F1 For Help" and "You Must Press Enter to Save Changed Values".

When the EGO Sensor reaches the programmed Coolant temperature the TEC EGO Feedback System starts monitoring the voltage of the EGO sensor, amplifies it 5 times, and determines if the engine is running lean or rich. Each of these parameters determines how the EGO system is going to respond to the EGO data. Instantaneous AFR Error Divisor responds to rapid changes in air to fuel ratio error rate. The system takes a programmed number of Samplings to determine how fast the Feedback system will respond. If it is rich (lean), the TEC waits a programmed number of cylinder events and then leans (enrichens) the fuel by a programmed amount. If the system detects a Rich or Lean condition then the system will respond with EGO CR to the limits of the Authority Range. If it is neither lean nor rich, the EGO stops altering GAMA and the EGO CR is Zeroed on the monitor screen. This function is momentarily disabled if the acceleration or the deceleration mode is on or the engine has been running for less than 20 seconds.

EGO Sensor Calibration



Changes made to the EGO Calibration Screen are made at the USER'S OWN RISK. If these values are not correct, they will cause engine related problems and could cause **Engine Failure**. These A/F Ratios must be in the range of 10 to 29.28. EGO Volts must be 0 to 5 volts increasing to the right by more than 20mv. If you change EGO sensor brand you should setup a new EGO Calibration based on OEM specs.

Idle Speed Control

IDLE SPEED CONTROL
_ □ ×

Idle Speed Control Activation: ON OFF You Must Press Enter to Save Changed Values

Number of Steps to Reset the ISM on Start (10 to 255) = Steps

MAP below which ISM is Disabled (10 to 104) = kPa Idle Advance

IDLE SPEED vs TEMPERATURE TABLE

Idle Speed	1400	1100	900	(500 to 2000 RPM) ** (-30 to 80 °C) **	ONLY Values have Yellow Background
Coolant Temp.	-30	0	60		

Coarse Idle Speed Control

RPM's off Target Idle at which Coarse Control is Active (46 to 300 RPM) = RPM

Number of Steps to Decrease Speed during Wait Period (1 to 25) = Steps

Decreasing Speed Wait Period (4 to 500 Ms) = Ms Press F1 For Help

Number of Steps to Increase Speed during Wait Period (1 to 25) = Steps

Increasing Speed Wait Period (4 to 500 Ms) = Ms

Fine Idle Speed Control

Number of Steps per Wait Period (0 to 25) = Steps

Print Form
<< Back

When the engine is first Started or the engine stalls, the idle speed motor opens all the way and then closes by a Programmed number of steps. This number of steps can be obtained by observing idle speed just after cranking. If the RPM is too low, lower this number; if the RPM is too high, raise this number. One of the most overlooked areas in tuning a stable idle is the base throttle plate settings, or minimum air rate. The function of the idle air control (IAC) motor is to compensate for cold start and other loads such as the A/C kicking in and out, or the transmission being put into and out of gear. The idle air control motor is not, however, supposed to be maintaining the base idle speed when hot. When the engine is fully warmed up and not under any load the idle should be about 25 to 50 RPM above the desired hot idle speed, assuring that the IAC is inactive.

In order to adjust these idle speed settings follow this outline:

1. Fully warm up the engine.
2. Disable the Idle Air Control motor and block the bypass-air passages.
3. Set the idle to approximately 25 RPM above the desired idle speed as outlined in the calibration.
4. Re-enable the IAC and verify that the engine RPM is still where you set it.

Idle Advance

IDLE ADVANCE
_ □ ×

ONLY Values have Yellow Background

Advance the Timing if the Idle Speed is to Low (0 to 10 deg @ 50 RPM per degree) = Degrees

Retard the Timing if the Idle Speed is to High (0 to 10 deg @ 50 RPM per degree) = Degrees

Press F1 For Help You Must Press Enter to Save Changed Values

<< Back

With the Idle Advance, if the Idle RPM is to high or to low then the TEC can retard the Advance to lower the RPM's or the TEC can add Advance to raise the RPM.

Rev Limiter

REV LIMIT PARAMETERS
⌵ ⌵ ⌵

ONLY Values have Yellow Background

Rev Limit Activation: ON OFF You Must Press Enter to Save Changed Values

Rev Limit Control =

Fuel CutOff Control = Press F1 For Help

Primary Rev Limit Engine Speed (1000 to 20000 RPM) = RPM

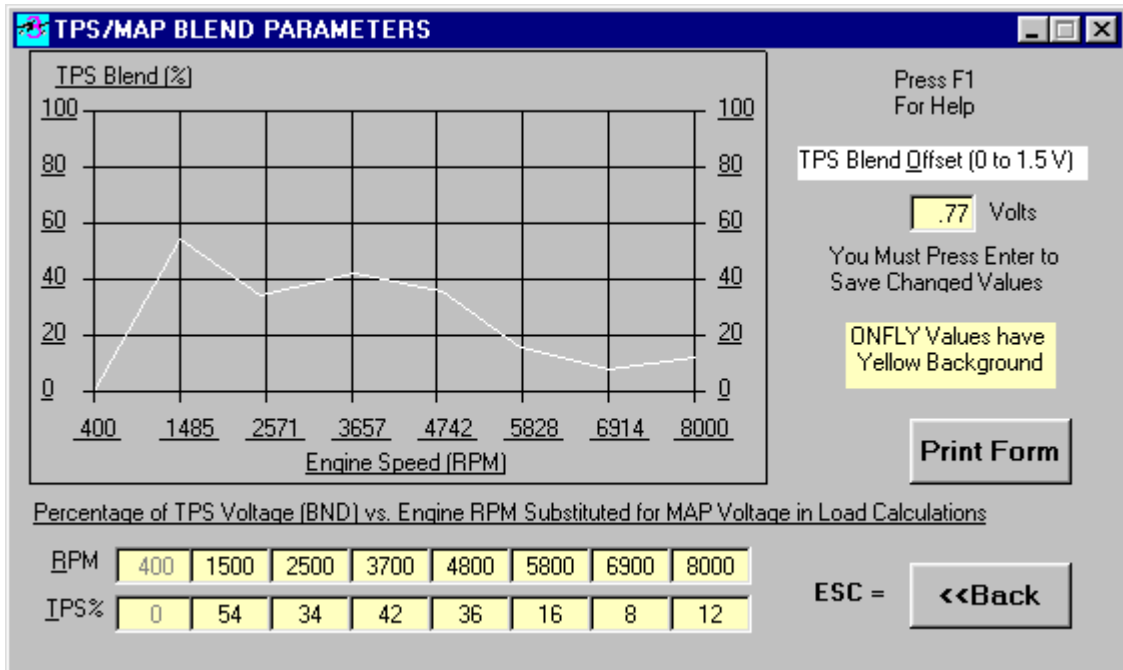
Auxiliary Rev Limit Engine Speed (1000 to 20000 RPM) = RPM

Rev Limit Hysteresis (0 to 1500 RPM) = RPM

The Rev Limiter turns either the ignition coils fully off or retards the timing to zero degrees. The Primary Rev limit defines the max RPM the engine will rev to and the Rev Limit Hysteresis define the RPM value the engine must slow by prior to the engine turning back on. In either mode of operation, the TEC cuts the fuel to a minimum. An Auxiliary Rev Limiter is available which is enabled by shorting the MAT pin to ground. When the Auxiliary Rev Limiter is operational, its RPM limit value supplants the regular Rev Limiter value; both Limiters use the same hysteresis value.

Fuel Enrichment Screen

TPS/MAP Blend



If this table is used, it must be created before any other MAP dependent calibrations such as the VE, GPO and the Advance tables!! This table blends MAP with the entered percentage of TPS, if TPS% = 75% at 1000 RPM, then MAP = 25% MAP input + 75% TPS input at 1000 RPM. The table is linearized between points and blends above and below the RPM scale are fixed at the lowest and highest TPS% respectively. A TPS% value of 0 turns

off blending. This blending is useful when calibrating eccentric cammed engines where the MAP sensor reading is not reflective of load at certain RPM's. Since MAP is normally at its highest value during cranking, it is wise to set the initial one or two RPM values to say 400 and 600 with their TPS% values = 0. All percentage values must be entered as whole numbers (i.e. 25 not .25).

TPS/MAP Acceleration

TPS/MAP ACCELERATION ENRICHMENTS

Throttle Position Rate of Change Enrichment Activation: ON OFF

Manifold Absolute Pressure Rate of Change Enrichment Activation: ON OFF

ACE0 Throttle Position Rate of Change Sensitivity (0.75 to 52.5 V/sec) = V/sec

ACE1 Manifold Absolute Pressure Rate Sensitivity (0.06 to 4 kPa) = kPa/ms

One Second Acceleration Enrichments

ACE2 Temperature Based, 1 sec ACCEL Enrichment (0 to 250% FPW) = %

ACE3 Constant, 1 sec ACCEL Enrichment (0 to 150% FPW) = %

Variable Time Acceleration Enrichments

ACE4 Time for Variable Time ACCEL Enrichments (0.25 to 2 sec) = sec (in .25 sec steps)

ACE5 Variable Time ACCEL Enrichments (0 to 250% FPW) = %

ACE6 Manifold Pressure Rate of Change Enrichment (0 to 250% FPW) = %

ACE7 Constant, Variable Time ACCEL Enrichments (0 to 150% FPW) = %

Variable Time, Injector Pulsewidth Enrichments

ACE8 Fixed Pulsewidth Enrichment (0 to 15 ms) = ms

ACE9 Time to Add the Fixed Pulsewidth Enrichment (0 to 15 sec) = sec

Press F1 For Help

You Must Press Enter to Save Changed Values

ONLY Values have Yellow Background

Print Form

<< Back

The Throttle Position Rate of Change sets the sensitivity at which the TEC will go into the acceleration mode. If the throttle is moving faster than this rate, as in a rapid depression of the pedal, the acceleration enrichments will start. Several acceleration enrichments are provided which can be adjusted in length of time and amount. These values set the time over which the acceleration enrichments will be activated. All percentage values must be entered as whole numbers (i.e. 100 not 1.00).

Deceleration Fuel Cut-off

DECELERATION FUEL CUT-OFF

Deceleration Fuel Cut-off Activation: ON OFF

RPM Limits of Activation

DCCL0 Cold RPM Above Which DECEL Activates (0 to 3900 RPM) = 1900 RPM

DCCL1 Hot RPM Above Which DECEL Activates (0 to 3900 RPM) = 1600 RPM

Throttle Position Rate of Change Sensitivity

DCCL2 IPS Rate Above Which DECEL Activates (0.75 to 52.5 V/sec) = 1 V/sec

Manifold Absolute Pressure Activation

DCCL3 MAP Reading Below Which DECEL Activates (10 to 104 kPa) = 26 kPa

Post Deceleration Enrichment

DCCL4 One Second Enrichment After DECEL Ends (0 to 150% FPW) = 0 %

Print Form

<< Back

ONLY Values have Yellow Background

You Must Press Enter to Save Changed Values

Press F1 For Help

This is the flow percentage below which the engine is in the over-run (excess vacuum) condition. The Deceleration Fuel Cut-off value should be set by observing the flow percentage at idle-neutral and subtracting 8 kPa from it. Recheck this number by causing the engine to go into an over-run condition, such as in a coast down, and observing whether or not the flow% drops below the flow percentage value. It should drop about 3 to 4 kPa below the DCCL3 Value. All percentage values must be entered as whole numbers (i.e. 100 not 1.00).

TPS/MAP Acceleration

TPS/MAP ACCELERATION ENRICHMENTS

Throttle Position Rate of Change Enrichment Activation: ON OFF

Manifold Absolute Pressure Rate of Change Enrichment Activation: ON OFF

ACE0 Throttle Position Rate of Change Sensitivity (0.75 to 52.5 V/sec) = 4 V/sec

ACE1 Manifold Absolute Pressure Rate Sensitivity (0.06 to 4 kPa) = 4 kPa/ms

One Second Acceleration Enrichments

ACE2 Temperature Based, 1 sec ACCEL Enrichment (0 to 250% FPW) = 0 %

ACE3 Constant, 1 sec ACCEL Enrichment (0 to 150% FPW) = 0 %

Variable Time Acceleration Enrichments

ACE4 Time for Variable Time ACCEL Enrichments (0.25 to 2 sec) = 0.25 sec (in .25 sec steps)

ACE5 Variable Time ACCEL Enrichments (0 to 250% FPW) = 0 %

ACE6 Manifold Pressure Rate of Change Enrichment (0 to 250% FPW) = 0 %

ACE7 Constant, Variable Time ACCEL Enrichments (0 to 150% FPW) = 0 %

Variable Time, Injector Pulsewidth Enrichments

ACE8 Fixed Pulsewidth Enrichment (0 to 15 ms) = 0 ms

ACE9 Time to Add the Fixed Pulsewidth Enrichment (0 to 15 sec) = 0 sec

Print Form

<< Back

ONLY Values have Yellow Background

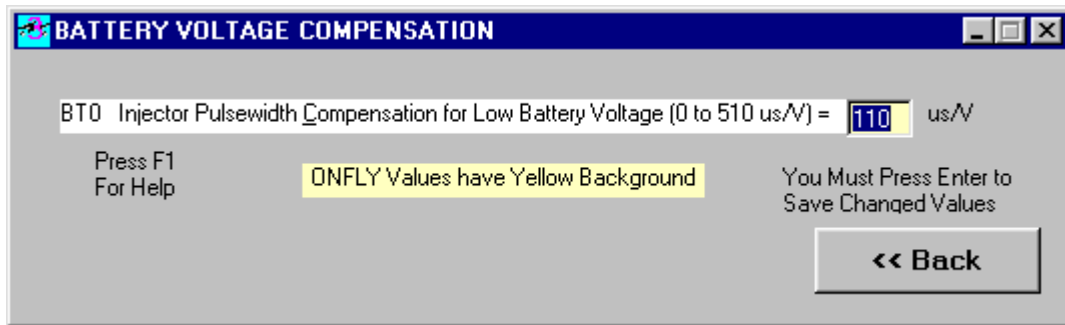
Press F1 For Help

You Must Press Enter to Save Changed Values

The MAP Rate of Change sets the sensitivity at which a rapid increase in the MAP will trigger the acceleration enrichments. A rapid opening of the throttle plate causes the MAP to rise quickly. Several acceleration enrichments are provided which can be adjusted in length of time and amount. These values set the time over which the

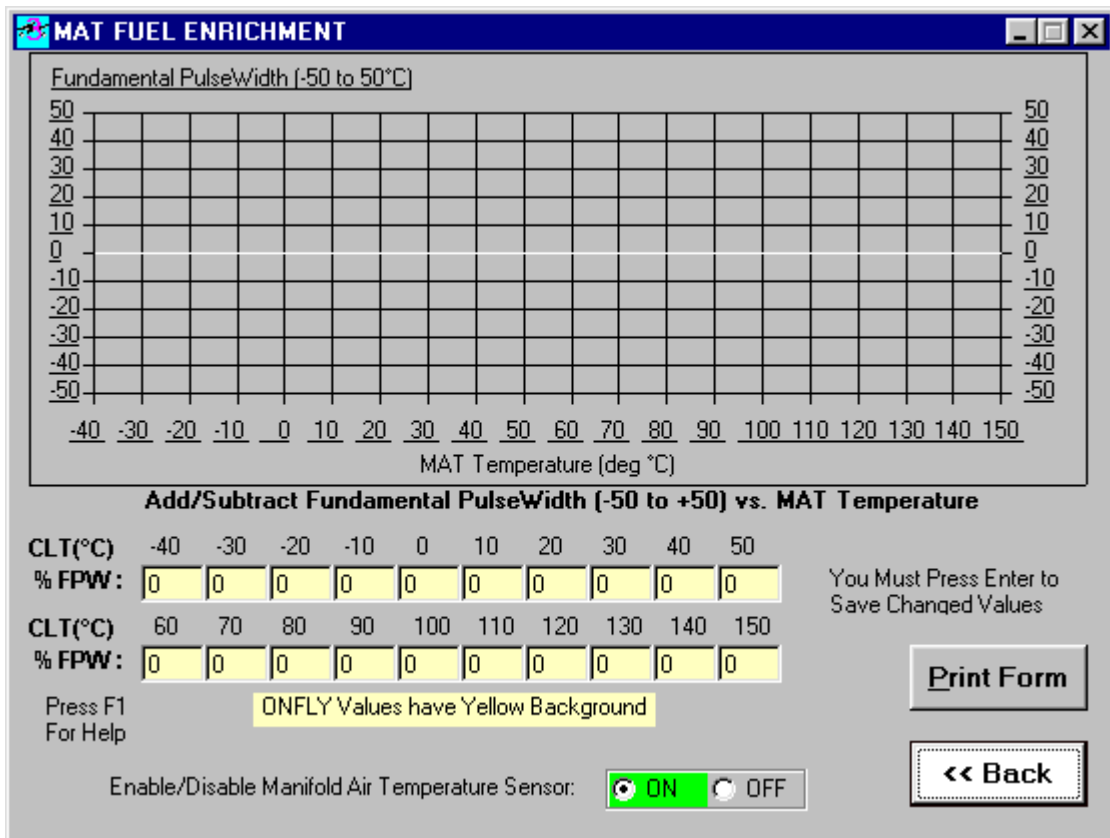
acceleration enrichments will be activated. All percentage values must be entered as whole numbers (i.e. 100 not 1.00).

Battery Voltage Compensation



The amount of DR0 and/or DE0 that gets added or subtracted from the enrichments is determined by the temperature of the MAT Sensor. If MAT is 130°C then the full amount of DR0 is applied to the advance. If MAT is 25°C or less then DR0 has no influence on the advance. The TEC linearizes the values between 25°C and 130°C. If MAT is -30°C then the full amount of DE0 is added to the enrichments. If MAT is 80°C then the full amount of DE0 is subtracted from the enrichments. At a MAT of 25°C the amount DE0 is 0. For BT0 the TEC increases the injector time if the battery is lower than 12 volts. It does so as a function of how many volts the battery is below 12 volts. Likewise, if the battery is higher than 12 volts, the TEC will begin reducing the pulse width. All percentage values must be entered as whole numbers (i.e. 100 not 1.00).

MAT Fuel Enrichment



Starting Enrichments

STARTING ENRICHMENTS & PARAMETERS

One Second Starting Enrichments

SE0 Temperature Based, 1 sec Starting Enrichment (0 to 250% FPW) = %

SE1 Constant, 1 sec Starting Enrichment (0 to 150% FPW) = %

PW0 Fixed, 1 sec Starting Pulsewidth (0 to 15 ms) = ms

CLT0 Coolant Temperature Below Which PW0 Activates (-30 to 80 deg) = °C

Press F1 For Help

ONLY Values have Yellow Background

Twenty Second Starting Enrichments

ASE0 Temperature Based, 20 sec Starting Enrichment (0 to 250% FPW) = %

ASE1 Constant, 20 sec Starting Enrichment (0 to 150% FPW) = %

You Must Press Enter to Save Changed Values

Fuel Pump Turn-on Time

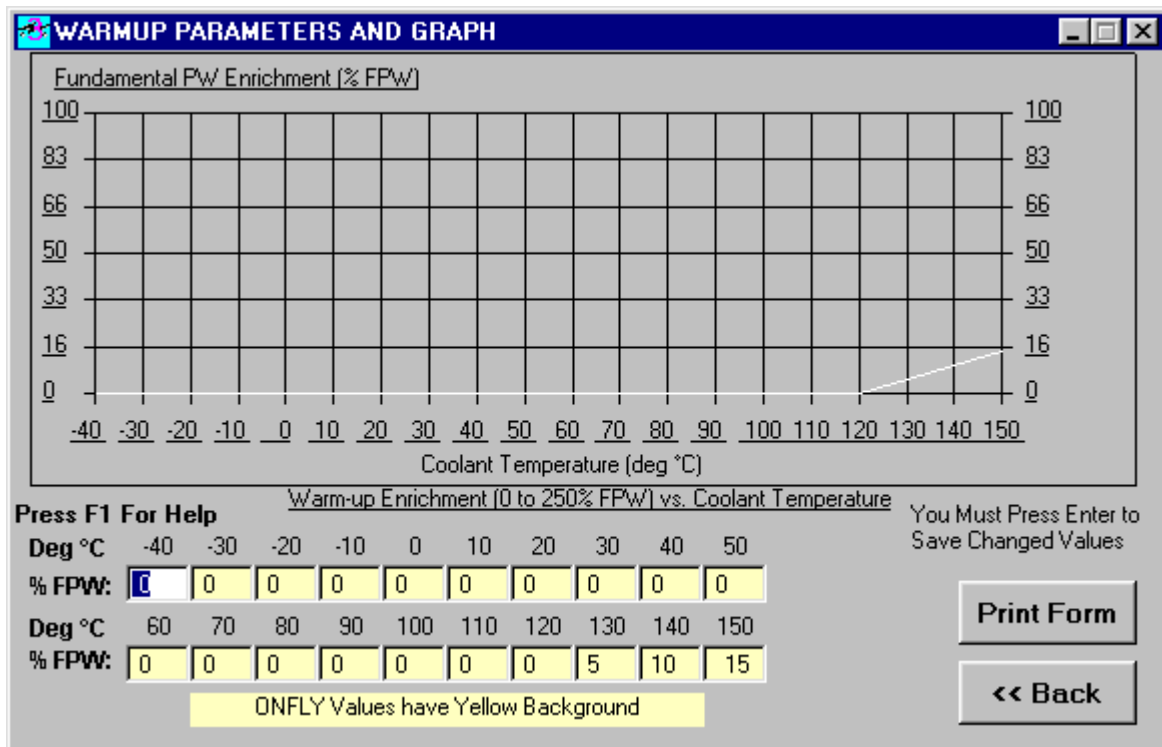
Set Constant for the Fuel Pump Turn-on Time (1 to 20 seconds) = sec

Print Form

<< Back

This extra GAMA is added to the current GAMA for one full second after the start of engine cranking. Its full value is added in if the coolant temperature is -30°C and then drops linearly to zero at 80°C. Then the enrichment is ramped down over 20 seconds from the start of cranking. The amount of fuel added depends on engine temperature. At -30°C, the full, programmed GAMA is added. There is a linear drop off of GAMA to a value of zero at 80°C. The Fuel Pump is turned on when the key is turned on. The fuel is pumped for a programmed number of seconds before turning off then is pumped only to maintain the correct fuel pressure.

Warm-up Enrichments



This table adds the programmed amount of GAMA to the current GAMA at the desired engine temperature. Straight-line linearization is used between the 10-degree steps and the value at 80°C is always zero. All percentage values must be entered as whole numbers (i.e. 100 not 1.00).

OverBoost Fuel Cutoff

The screenshot shows a software window titled "OVERBOOST FUEL CUTOFF". At the top, a yellow banner reads "ONLY Values have Yellow Background". To the right, a note says "You Must Press Enter to Save Changed Values". The main area contains two adjustable settings: "OverBoost Control Activation" with "ON" selected (green) and "OFF" (red); and "Maximum Manifold Pressure (10 to 104 kPa)" set to "104" kPa. Below this is "OverBoost Fuel Cutoff Timer (.25 to 10 sec)" set to "3.25" SEC. A "Print Form" button is to the right of the pressure setting. At the bottom, there is a "Press F1 For Help" instruction and a "<< Back" button.

GPO Control

4 GPO's

This section describes the templates that are used to create each unique GPO environment. We only have one single GPO but that GPO can be structured to operate in several different modes.

The screenshot shows a software window titled "GPO1 CONTROL". On the left, it says "Current Active GPO1 Control is Highlighted" and "GPO # 1 Enabled" is highlighted in green. Below this are buttons for "Full GPO1 Control Table", "AC Control", "Aux Fuel Pump Control", and "Fan Thermo Control". On the right, there is a cyan warning box: "The GPO Control Type Can Only be Changed in NO CONNECTION Mode." Below this are buttons for "Intake Runner Control", "NOS Switch Control", "Shift Light Control", and "Torque Converter Control". At the bottom right, it says "ESC = << BACK". A "Press F1 For Help" instruction is located in the center.

Full GPO Control Table

GPO1 PARAMETERS
_ □ ×

MAP
(10 to 104 kPa)

ONLY Values have Yellow Background

General Purpose Output # 1 (0 to 100% Duty Cycle)

You Must Press Enter to Save Changed Values

104	0	0	0	100	100	100	100	100	100	100	100	100	100	100	100	100
98	0	0	0	100	100	100	100	100	100	100	100	100	100	100	100	100
92	0	0	0	100	100	100	100	100	100	100	100	100	100	100	100	100
86	0	0	0	100	100	100	100	100	100	100	100	100	100	100	100	100
80	0	0	0	100	100	100	100	100	100	100	100	100	100	100	100	100
74	0	0	0	100	100	100	100	100	100	100	100	100	100	100	100	100
68	0	0	0	100	100	100	100	100	100	100	100	100	100	100	100	100
62	0	0	0	100	100	100	100	100	100	100	100	100	100	100	100	100
56	0	0	0	100	100	100	100	100	100	100	100	100	100	100	100	100
50	0	0	0	100	100	100	100	100	100	100	100	100	100	100	100	100
44	0	0	0	100	100	100	100	100	100	100	100	100	100	100	100	100
38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

800 1200 1500 2000 2500 3000 3500 4000 4500 5000 5500 6000 6500 7000 7500 8000

Engine Speed (RPM)

GPO1 Frequency: 31Hz

Press F1 For Help

Cell Color Persist if Checked

Press F3 to Edit Rows.
Press F4 to Edit Columns.
Type Alt S to Edit Full Table.
Type Alt U to Undo last Row, Column or Full Table Edit.

Use Mouse or Up and Down Arrow Keys to Change GPO1 Frequency

Press F1 For Help

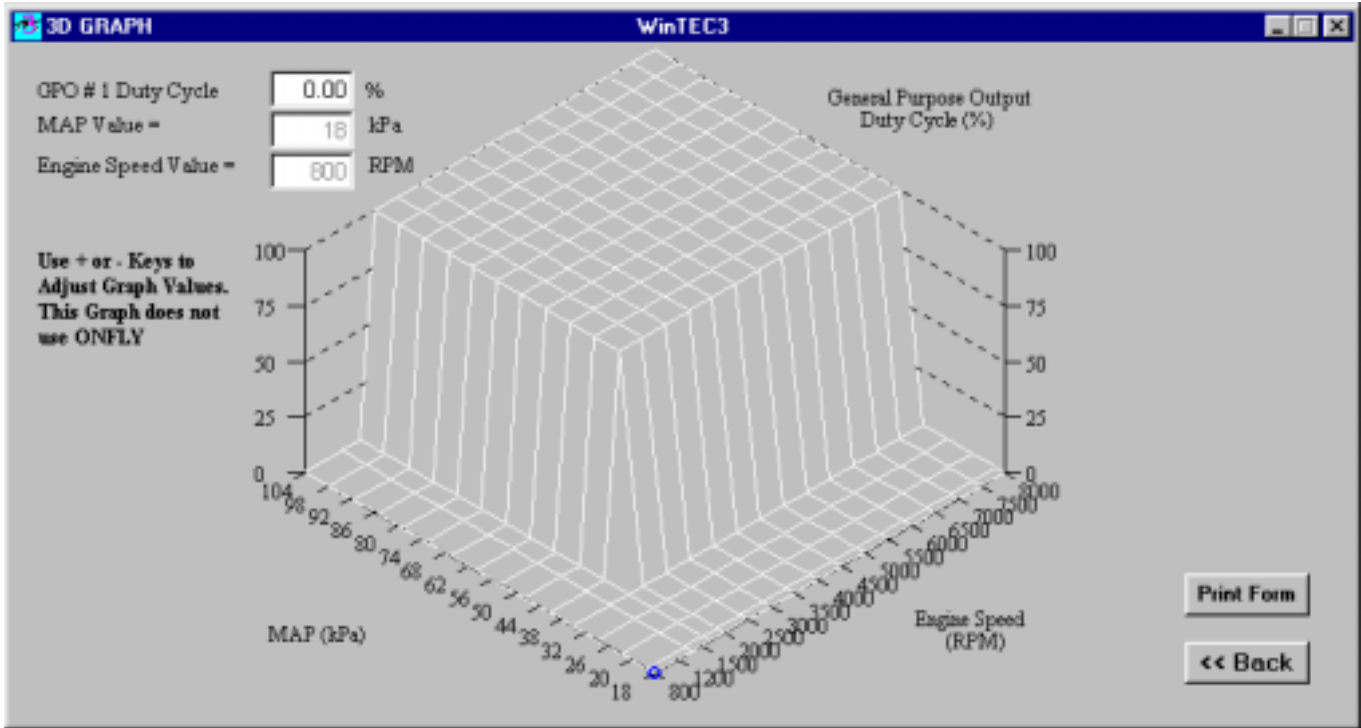
<< Back

GPO1 Table Graph

Print Form

The TEC has one General Purpose Output (GPO) that utilizes a 16 x 16 table to specify the duty cycle percentage at RPM and MAP points as defined in the Advance table. When hooked up as a 'low side' driver, any solenoid can be pulsewidth modulated to vary its opening as a function of engine speed and load. The TEC linearizes between these points, extrapolates beyond the table and turns the GPO off at zero RPM. The GPO can be tweaked by modifying the duty cycle as the engine is running using the engine monitor screen. All percentage values must be entered as whole numbers (i.e. 100 not 1.00). Each GPO table Cell can be edited by using the arrow keys to select the cell you want to edit or you can use F3 to edit a complete Row of data or F4 to edit a complete Column of data or you can type "S" and enter a Constant for the entire table. ONLY can only update the GPO and GPO Frequency data fields. RPM and MAP/kPa must be updated in the Advance Table in Edit mode and Downloaded using Program TEC from the Main Menu. **For TEC Special build units that have the GPO Enabled,** the value entered into each cell determines the amount of pulsewidth the secondary injectors will deliver based on 100% of the primary injector pulsewidth. Both the Primary and secondary injectors fire at the same event timing.

GPO Control Interactive 3D Graph



With the GPO interactive 3D graph, the user can move the blue oval cursor to any point on the graph by using the arrow keys (see * 3D Graph Arrow Keys above) on the keyboard. Once you get to the point, as defined in the fields in the upper left hand corner, that you want to change, just press the + key or the - key to move the values up and down at that point. When you have reached the desired value, you can return to the GPO Control Table and you will see that the value at that point has been changed and is now the same as the 3D Graph. This will help the user to visualize the GPO Control Table values and how they relate.

GPO AC Control

The TEC only has one GPO but the GPO_AC Control give the tuner the capability of turning a relay On/Off when you need to control the Air conditioning system. It can also be used for other RPM/kPa based On/Off relay controlled devices.

GPO Aux Fuel Pump Control

GPO1 AUX FUEL PUMP CONTROL

ONLY Values have Yellow Background You Must Press Enter to Save Changed Values

Enter MAP kPa above which AFPC is active = 54 kPa

AND

Enter Engine RPM below which AFPC is always OFF = 1200 RPM

Press F1 For Help RETURN

The TEC only has one GPO but the GPO Aux Fuel Pump Control give the tuner the capability of turning a relay On/Off when you need to control an Aux fuel Pump. It can also be used for other RPM/kPa based On/Off relay controlled devices.

GPO Fan Thermo Control

GPO1 FAN THERMO CONTROL

ONLY Values have Yellow Background You Must Press Enter to Save Changed Values

Enter Coolant Temperature(0 to 130°C) above which Fan is ON = 95 Deg C

AND

Enter Coolant Temperature(0 to 130C) below which Fan is OFF = 80 Deg C

Press F1 For Help RETURN

The TEC only has one GPO but the GPO Fan Thermo Control gives the tuner the capability of turning a relay On/Off when you need to control the electrical fan system. This control only works while the TEC is in the Key ON state. It can also be used for other On/Off temperature controlled devices.

GPO Intake Runner Control

GPO1 INTAKE RUNNER CONTROL

ONLY Values have Yellow Background You Must Press Enter to Save Changed Values

Enter MAP kPa above which Intake Runners are ON = 60 kPa

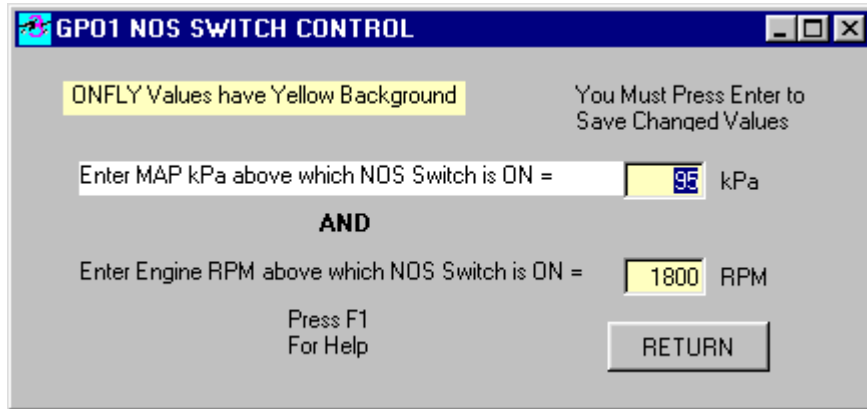
AND

Enter Engine RPM above which Intake Runners are ON = 3800 RPM

Press F1 For Help RETURN

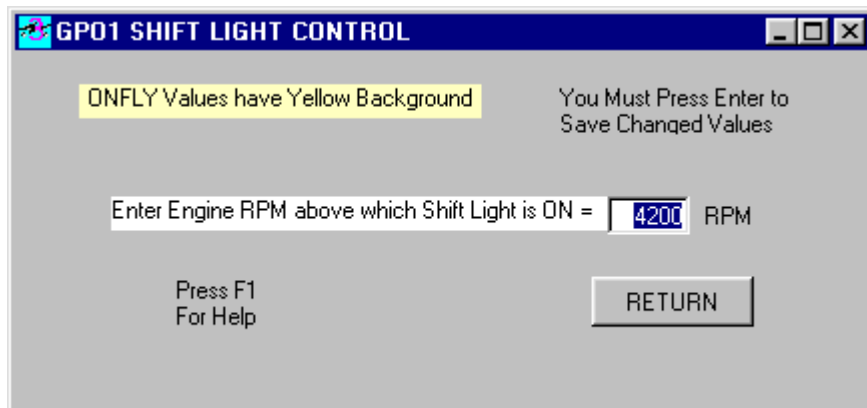
The TEC only has one GPO but the GPO Intake Runner Control gives the tuner the capability of turning a relay On/Off when you need to control Engine Air Intake Runners. It can also be used for other RPM/kPa based On/Off relay controlled devices.

GPO NOS Control



The TEC only has one GPO but the GPO NOS Switch Control give the tuner the capability of turning a relay On/Off when you need to control NOS. It can also be used for other RPM/kPa based On/Off relay controlled devices.

GPO Shift Light Control



The TEC only has one GPO but the GPO Shift Light Control give the tuner the capability of turning a Warning light or Shift point light On/Off controlled only by RPM. It can also be used for other RPM based On/Off relay controlled devices.

GPO Torque Converter Control

GPO1 TORQUE CONVERTER CONTROL

ONLY Values have Yellow Background You Must Press Enter to Save Changed Values

1st STAGE RPM CONTROL

Enter Engine RPM Above which the TCC is Engaged = RPM

Enter Engine RPM Hysteresis Below which TCC is OFF = RPM

1st STAGE MAP CONTROL

Enter Low MAP kPa above which the TCC is Engaged = kPa

Enter Low Hysteresis MAP kPa below which TCC is OFF = kPa

2nd STAGE MAP CONTROL

Enter High MAP kPa below which TCC is Engaged = kPa

Enter High Hysteresis MAP kPa above which TCC is OFF = kPa

Press F1 For Help

The TEC only has one GPO but the GPO Torque Converter Control gives the tuner the capability of controlling the shift points of most Automatic Transmissions. It can also be used for other RPM/kPa based On/Off relay controlled devices.

Analog/Digital and Datalog Inputs Templates

A/D Input Control # 1

Enable/Disable Fuel Trim AC/Load Valet Switch

Datalog Enable: Advance Trim GPO Duty Trim NOS Retard

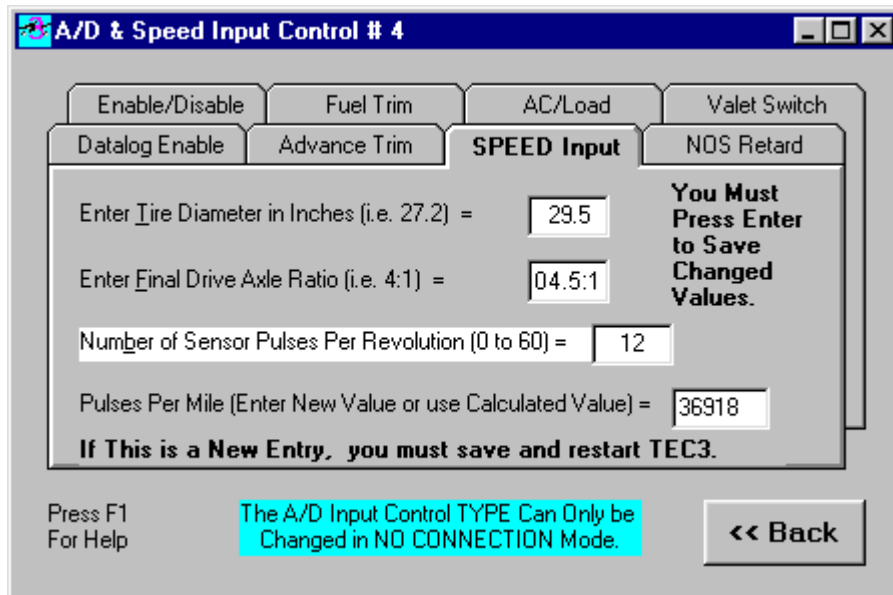
RPM Above which DataLogging Will Begin = RPM
0 to 20000 RPM

Internal DataLog Samples per second =

You Must Press Enter to Save Changed Values.

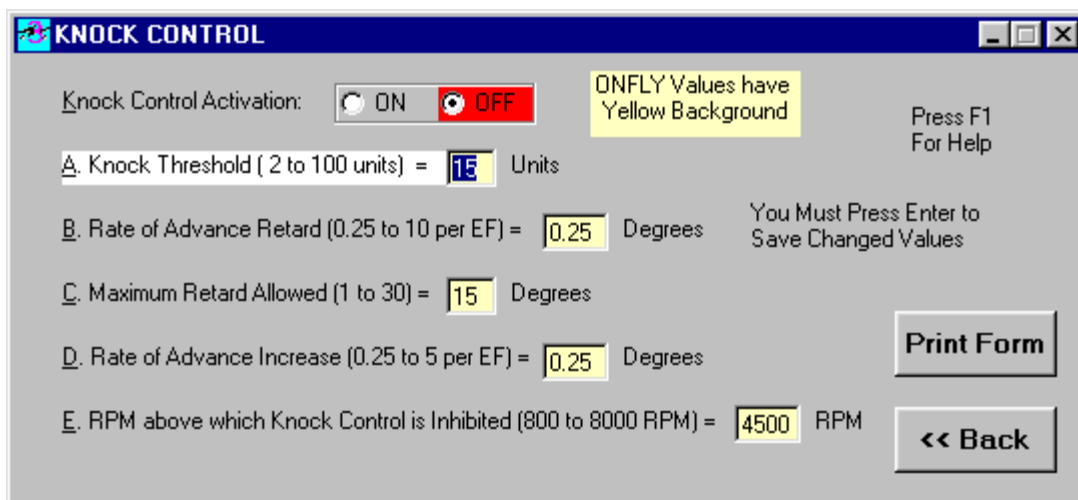
Press F1 For Help The A/D Input Control TYPE Can Only be Changed in NO CONNECTION Mode. << Back

There are 4 Analog/Digital Inputs. Each Input can service a single template but no two inputs can service the same template type. Each of the templates have unique Help Files that can be accessed using the "F1" key. The TEC3 Installation and Calibration Manual will show you how to configure the inputs and the Help files will tell you how to setup the inputs. A/D Input Control # 1 & 2 both have GPO Duty Trim values that correspond to the two Full GPO Control Tables. Each A/D Input can control one GPO Table Trim.



A/D Inputs # 3 & 4 replace the GPO Duty Trims with SPEED Inputs. SPEED Input # 4 is the primary speed input that controls other speed related values. A/D inputs 3 & 4 can each control a speed input but input 3 just shows the current speed.

Knock Control

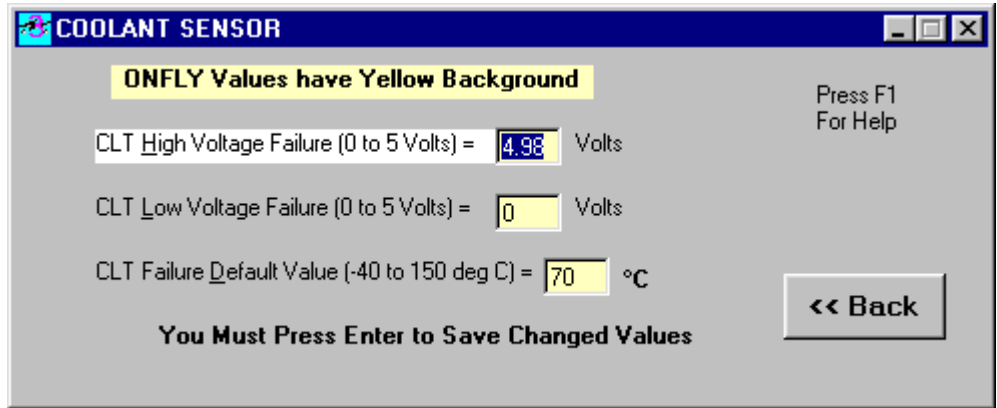


If knock is occurring greater than the knock threshold 'A' then TEC decreases (retards) the advance by 'B' degrees per engine function (EF) but not to exceed a maximum of 'C' degrees retard. If knock is less than the knock threshold 'A' then the TEC increases the advance by 'D' degrees per engine function (EF) not to exceed the calculated advance. Knock control is inhibited if the RPM exceeds 'E' RPM value; it is recommended to set this RPM not greater than 4500 RPM.

Sensor Parameters

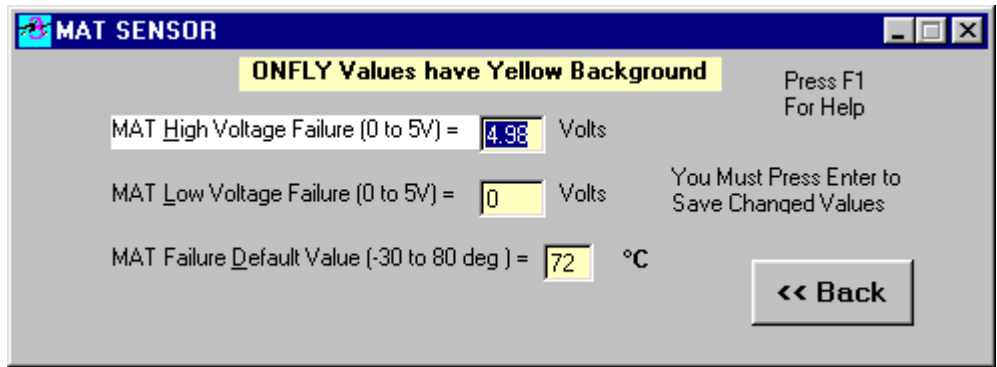
All of these sensor failure parameters define the highest and lowest normal voltage expected from the sensor. If these voltage limits are exceeded, a constant default value will be substituted and a check engine malfunction code will be activated. To disable any of the sensors and only use the default value, set its high voltage failure parameter to zero.

Coolant Sensor



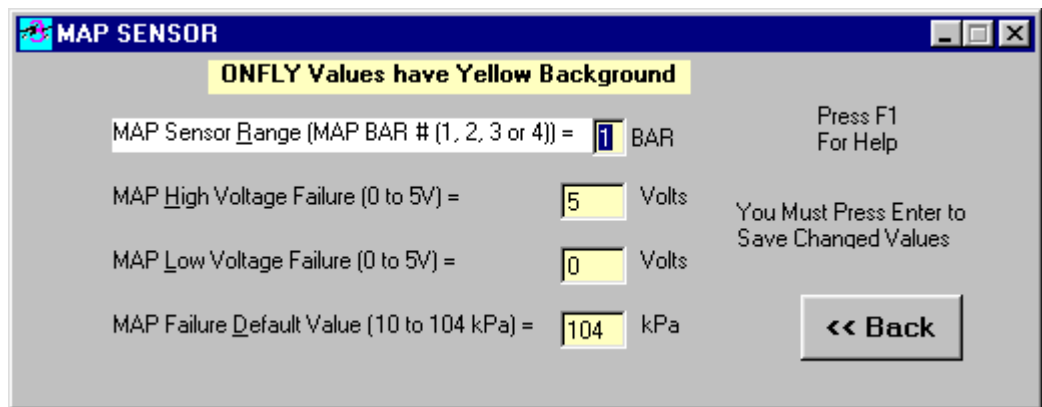
The CLT Sensor has limits of its capability. If the High or Low Voltage is higher or lower than the voltages entered, then it defaults to its Failure value and turns on the sensor failure display on the Monitor screen. A Coolant sensor failure also causes the Check Engine Light to blink a code 1 if a light is installed.

MAT Sensor



The MAT Sensor has limits of its capability. If the High or Low Voltage is higher or lower than the voltages entered, then it defaults to its Failure value and turns on the sensor failure display on the Monitor screen. A MAT sensor failure also causes the Check Engine Light to blink a code 2 if a light is installed.

Map Sensor



The MAP Sensor has limits of its capability. If the High or Low Voltage is higher or lower than the voltages entered, then it defaults to its Failure value and turns on the sensor failure display on the Monitor screen. A MAP sensor failure also causes the Check Engine Light to blink a code 3 if a light is installed.

EGO Sensor

EGO SENSOR

ONFLY Values have Yellow Background

Seconds before Lean Failure (1 to 255) = Seconds

Seconds before EGO Sensor Starts (1 to 20) = Seconds

Press F1 For Help

You Must Press Enter to Save Changed Values

<< Back

The EGO Sensor has limits of its capability. If the High or Low Voltage is higher or lower than the voltages entered, then it defaults to its Failure value and turns on the sensor failure display on the Monitor screen. An EGO sensor failure also causes the Check Engine Light to blink a code 4 if a light is installed. The Exhaust Gas sensor failure parameter is a function of how long the sensor senses a lean condition. The Exhaust Gas sensor may be disabled by turning the EGO function off in the EGO Parameters.

TPS Sensor

TPS SENSOR

ONFLY Values have Yellow Background

TPS Fully Closed Throttle Voltage = Volts

TPS Wide Open Throttle Voltage = Volts

TPS High Voltage Failure (0 to 5V) = Volts

TPS Low Voltage Failure (0 to 5V) = Volts

TPS Failure Default Value (0 to 5V) = Volts

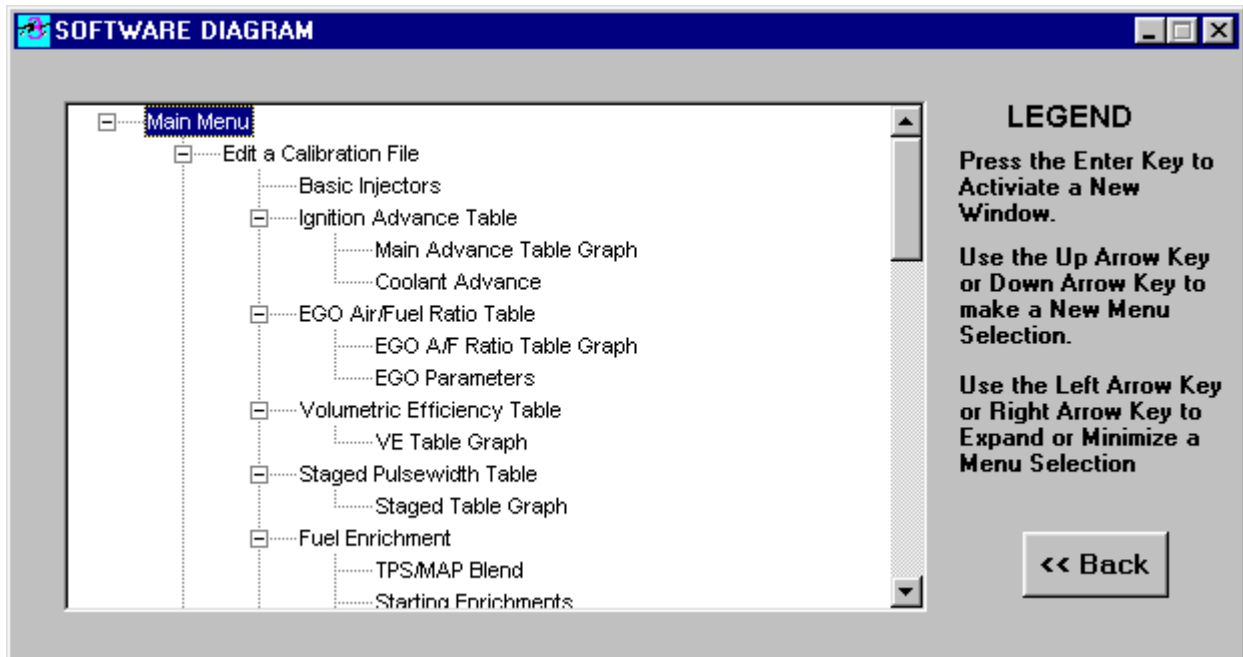
Press F1 For Help

You Must Press Enter to Save Changed Values

<< Back

The TPS Sensor has limits of its capability. If the High or Low Voltage is higher or lower than the voltages entered, then it defaults to its Failure value and turns on the sensor failure display on the Monitor screen. A TPS sensor failure also causes the Check Engine Light to blink a code 5 if a light is installed.

Software Diagram

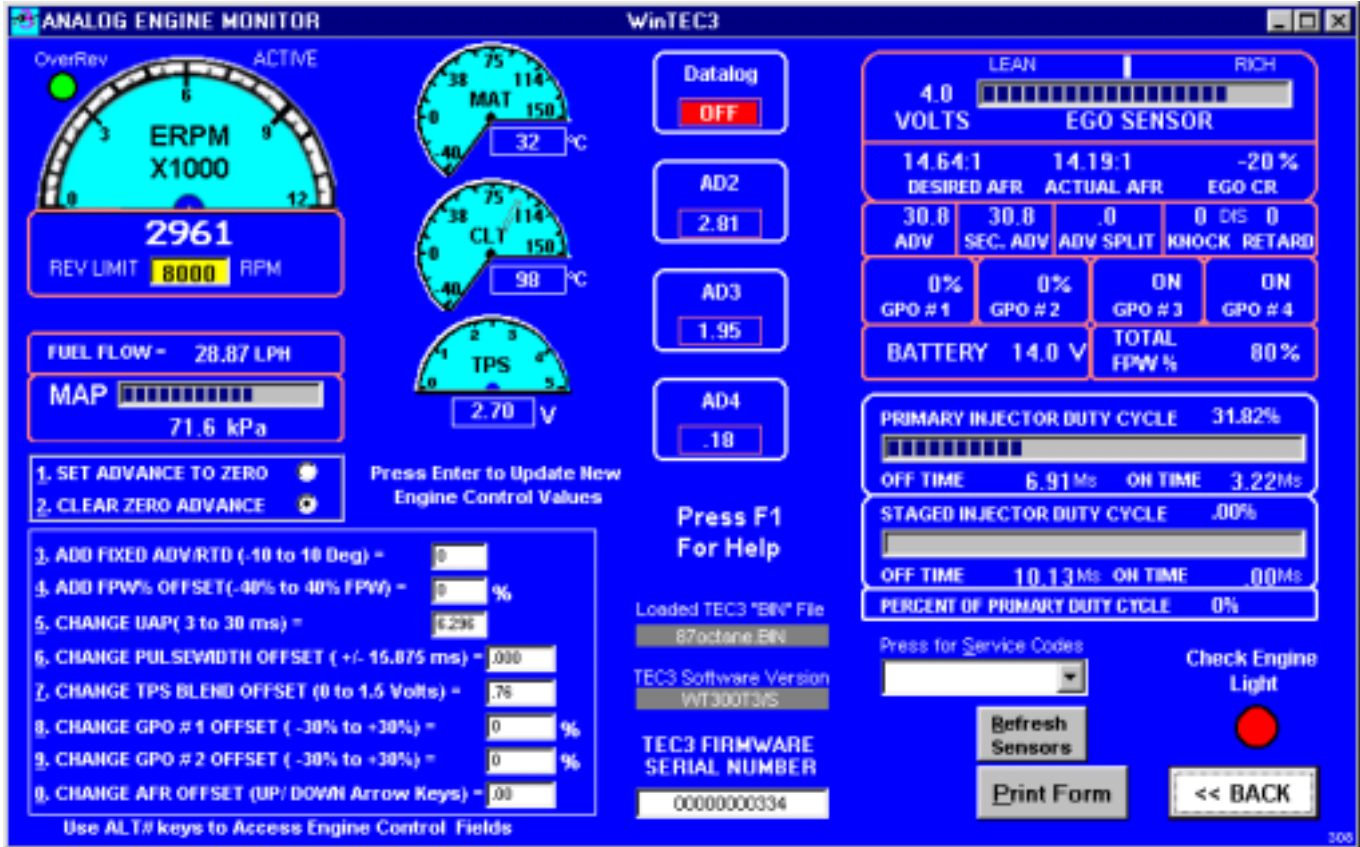


This Function allows the User to choose any of the software functions from within the WinTEC3 Program. By using the keyboard or a mouse you can choose a function by highlighting the function and pressing the “Enter” key. Using the Keyboard, use the Up Arrow Key or Down Arrow Key to make a New Menu Selection. Use the Left Arrow Key or Right Arrow Key to Expand or Minimize a Menu Selection. If you use a mouse you still have to press the “Enter” key to activate the selection.

Monitor Engine Functions

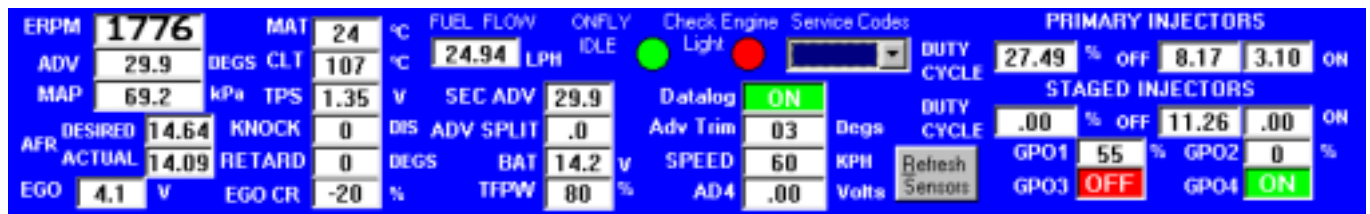
Now there are two Engine Monitor screens available. The first is the default Analog screen that operates only in EDIT Mode and the second is a Digital screen used for the ONFLY Real Time Data System. These different screens can be chosen from the “Options” screen that we will discuss later.

Analog Engine Monitor Screen (Default)



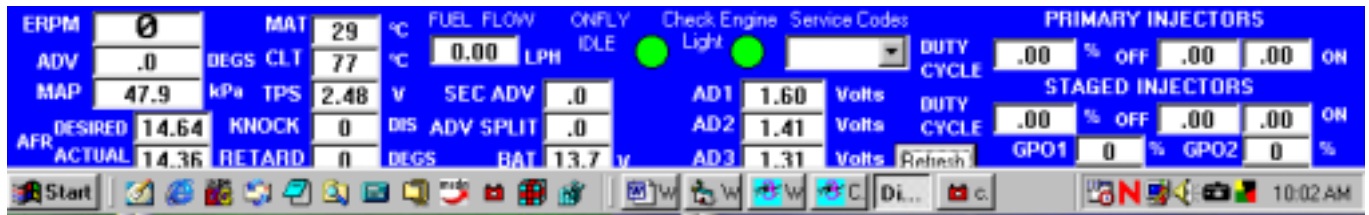
By selecting "Monitor Engine Function" in the Edit Mode, which engages the Analog Monitor Screen, you will be able to gather information necessary before starting your engine for the first time. During start up and running, this feature will allow you to watch, in real time, exactly what your engine is doing. Changes to fuel flow and ignition timing may also be made through the engine monitor screen, while the engine is running. NOTE: Some calibration values are needed for the engine monitor to display all info properly, i.e. duty cycle reference number and MAP bar number, first go to "Edit a Calibration File" and load a Valid "BIN" file, so that the monitor screen can retrieve this information. To access one of the data update fields on the Monitor Screen, press the 'ALT + Number' key to select that field. Selecting the ALT + 1 key will automatically "Set Advance to Zero" or Selecting the ALT + 2 key will automatically "Clear Zero Advance". Selecting the ALT + 9 key will allow the user to raise or lower the "AFR OFFSET" by pressing the up arrow or the down arrow. Selecting ALT + 4 allows the user to change the % of GAMA (+ or - 40%). Typing 'T' will change the Celsius temperature scale to the Fahrenheit scale. It also converts the kPa to Hg Absolute for manifold pressure display. Typing 'C' will toggle the EGO Sensor on and off from the Monitor Screen. By typing 'K' will kill the Engine so that you can observe the static values of the monitor screen. Typing 'E' while in the Monitor Screen will close the Monitor screen and bring up the "Edit a Calibration File" screen and it will ask for a valid "BIN" file. Press 'F1' to display Monitor Help Screen and show a list of the functions we just talked about. All percentage values must be entered as whole numbers (i.e. 100 not 1.00).

Digital Engine Monitor Screen (ONFLY Mode)



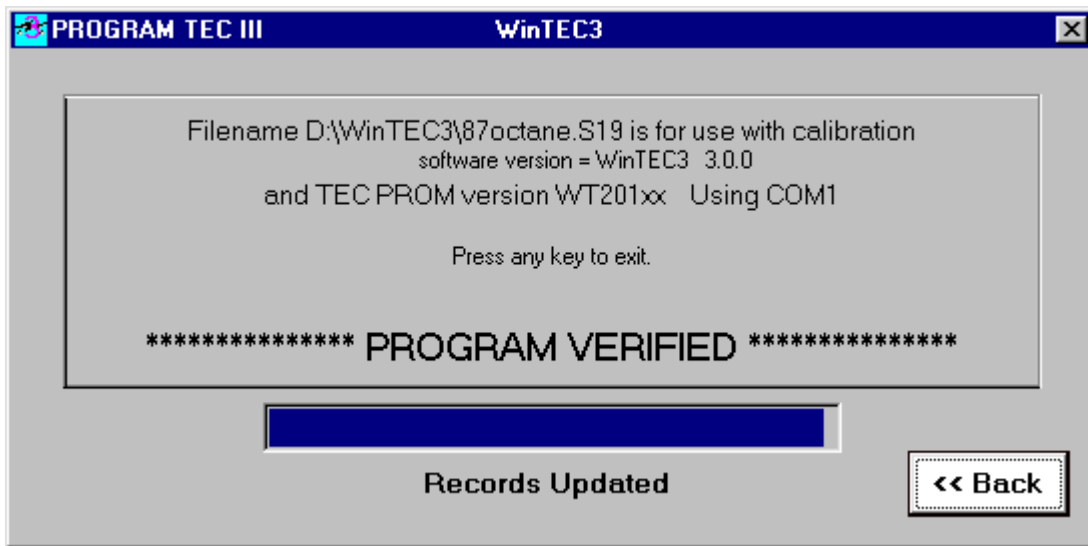
The Digital Engine Monitor Screen is active only when the ONFLY option has been selected and the Monitor Engine Function screen has been selected. It is displayed centered at the top of the screen and can be moved to any location on the screen. It is always on Top of all WinTEC3 screens. As you make changes to the TEC you will be able to see how a change affects the Engine in real time.

Digital Engine Monitor Screen and the Task Bar.



When using a Laptop at 800x600 resolution, the amount of data that is being displayed on the Digital ONFLY Monitor will overlap the Task Bar and the System Status Bar. This problem can be solved by using the higher resolution of 1024x768. If your Laptop does not have 1024x768 resolution then use the "Show TaskBar" and "Hide TaskBar" buttons to enable and disable the Task Bar as needed. Also, if the Task Bar has overlapped the Digital monitor screen, just change the focus to the Digital Monitor and the Task Bar will be overlapped by the Monitor screen. You can bring the Task Bar back up by changing focus back to the other Active screen. Use ALT+TAB to change the Focus of the currently Active Windows.

Program TEC



To get the TEC to respond to the changes that you have made only to the 'BIN' file you must first Save the 'BIN' file and then move the 'S19' file from your computer to the TEC by pressing the 'Program TEC' button. Make sure the cable is connected and use this command to send your new 'S19' calibration file to the TEC's memory. When the 'S19' calibration file is loaded correctly the program will respond with "PROGRAM VERIFIED". The Program TEC Option "ONLY" loads the S19 file and does not open a "BIN" file. You will always be asked to enter a New "S19" file name.

Auto Calibrate VE Table

Automatic VE Table Calibrator
WinTEC3 Version 3.0.0

Auto VE Table Calibrator CANNOT be used in ONFLY Mode

ERPM
3996

kPa
68.8

Press F2 to Recalibrate All Table cells from Original Values. Use a Mouse click to Recalibrate a single cell.

MAP
Max kPa 104

Automatic Volumetric Efficiency Table
Correction (-50% to 50% FPW)

104	1	10	10	22	26	30	20	34	16	30	20	46	20	50	47	47
98	0	5	10	18	26	28	28	15	34	15	16	20	28	48	46	43
92	0	0	5	10	22	26	28	32	12	32	17	44	25	46	41	38
86	0	0	0	-12	-2	24	20	6	20	8	30	16	24	44	39	35
80	0	0	0	4	-5	22	8	27	8	27	8	31	40	42	36	30
74	0	0	0	0	-10	0	28	24	6	26	26	28	38	40	34	32
68	0	0	0	0	-14	20	20	5	5	25	6	29	30	30	36	31
62	20	19	18	0	2	24	8	7	27	26	9	34	17	35	32	32
56	25	22	3	2	23	21	28	29	7	24	26	28	10	32	26	28
50	24	24	26	25	5	3	20	20	5	24	24	25	5	26	20	26
44	27	18	5	5	5	25	28	6	26	26	25	26	29	29	26	26
38	28	27	5	5	26	26	28	6	27	28	26	28	30	32	29	26
32	22	24	4	25	25	5	30	10	31	31	30	31	31	32	30	28
26	16	17	-3	-3	-3	17	28	15	33	33	33	33	33	33	33	30
20	17	0	0	21	22	23	28	28	26	24	26	28	30	32	32	26
14	-2	7	2	20	20	22	20	22	22	22	21	22	20	24	26	25

Press F1 For Help

PAGE # = 23
Engine Speed (RPM)

500100015002000250030003500400045005000550060006500700075008000

Save New Table to BIN File

Print Form

ESC = << Back

Exit without saving changes

The New Automatic VE Table Calibration Process can use input from either the TEC Unit as the Data Source or from a current DATALOG "DAT" File. Choose a "DAT" file from the list shown and Click on it to use that file as the data source or Click on the CONTINUE Button to use the TEC Unit Data Stream as the Data source. MAP, RPM and other settings are based on the current "BIN" File and should not be changed before the calibration is done. When the tuner enters the Auto Calibrate routine he is asked to enter a number of data points that the tuner wants to collect for each cell. The Minimum number is 5 data points. If you are using the TEC data stream you may also find that the EGO Correction (ICR) may not have started to report new correction values. This should start within 20 seconds. When the EGO Correction starts reporting new values, the Cell that is in range of the RPM and kPa as displayed to the left of the Table, will start to collect data each time that cell is hit. Keep collecting data until the cells in your query are filled and have turned Yellow. Each kPa and RPM Cell must be hit for a Programmable number of data points to calculate a new VE cell value. When you have completed the Calibration or when the End of File is reached in the "DAT" file, you can Press the SAVE button and this table will be saved as a new BIN file and can be downloaded to the TEC at a later time. If you press ESC or the << Back Button, the VE Table values are reset to their Original values and not saved. Press F2 to recalculated the Entire table from the Original values. Use the Mouse to Click on single cell to be recalibrated from the Original value. The Auto Calibrate VE Table is not active in the ONFLY Mode.

Create a Datalog File

CREATE A DATALOG FILE

ELECTROMOTIVE DATA ACQUISITION SYSTEM

Enter Data Capture Speed = **Must Press Enter to Save New Value**
1 = Slow; 2 = Medium; 3 = Fast

Enter the number of Data Log Pages 1 to 99999 Pages

<< CONTINUE ESC = << BACK

To Save a Datalog Session on Disk, hookup the TEC to the PC, the same as for engine monitoring. Get the PC ready to start the recording session by selecting "Create a Datalog File" button from the main menu. The computer will ask you for a filename in which to store the data. Enter the filename and press/click the 'OPEN' button. Now you must specify the rate at which to save the data. Select 1, 2 or 3. Speed depends on your computers clock rate and available storage but most people use 3 to get the highest resolution. Now determine how many screen repetitions you want to save. The screen repetitions should be entered in multiples of 2 (i.e. 2,10,34,82). Once initiated, data will start streaming across the screen graphically. When the line gets to the right edge of the window, it will clear and start over again. This will continue until all the repetitions you set are completed. You can use the Esc Key to end the session before you reach the Max number of repetitions.

View a Datalog File

View Data Setup

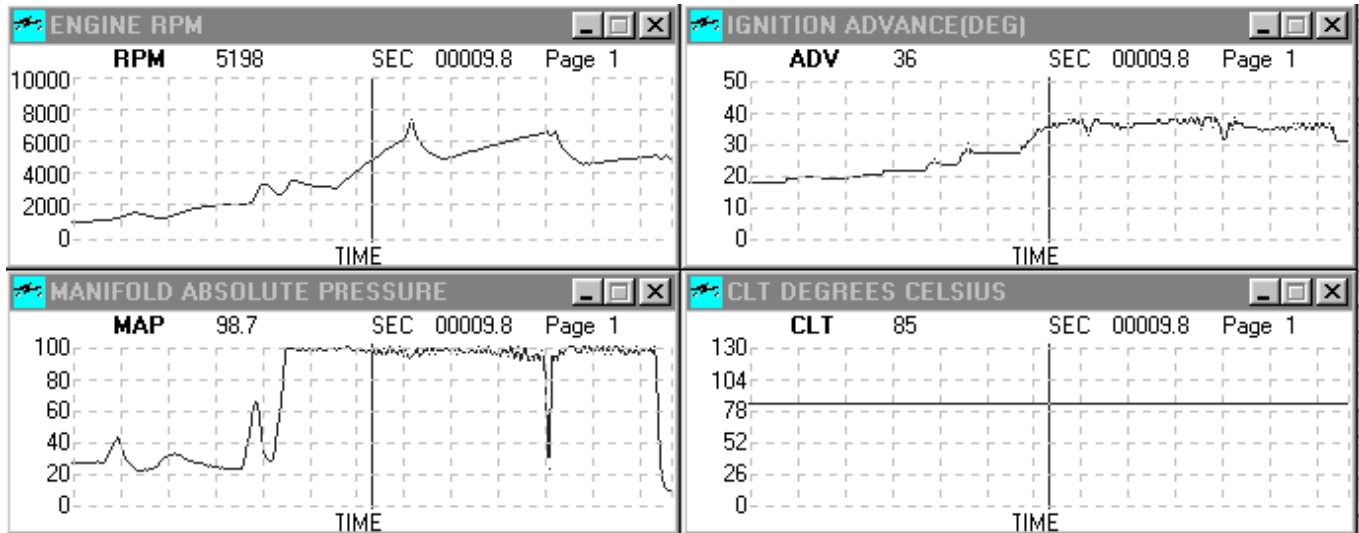
Type of Graphs
 Data View (Single Graph Format) *Enter 1 to 27 Selections for Data View
 Multi View (Multi Graph Overlay) *Requires High Res. Monitor
Enter 2 to 4 Selections for Multi View

<input checked="" type="checkbox"/> RPM	<input checked="" type="checkbox"/> MAT	<input checked="" type="checkbox"/> GPO1	<input type="checkbox"/> PWOFF	<input type="checkbox"/> AD2
<input checked="" type="checkbox"/> ADV	<input checked="" type="checkbox"/> TPS	<input type="checkbox"/> BAT	<input type="checkbox"/> SDUTY	<input type="checkbox"/> AD3
<input checked="" type="checkbox"/> MAP	<input checked="" type="checkbox"/> EGO CR	<input checked="" type="checkbox"/> KNOCK	<input checked="" type="checkbox"/> SPWON	<input checked="" type="checkbox"/> AD4
<input checked="" type="checkbox"/> CLT	<input checked="" type="checkbox"/> AFR	<input checked="" type="checkbox"/> INJ. DUTY	<input type="checkbox"/> SPWOFF	<input checked="" type="checkbox"/> GPO2
<input checked="" type="checkbox"/> TFPW	<input checked="" type="checkbox"/> EGO VOLTS	<input type="checkbox"/> PWON	<input type="checkbox"/> AD1	<input type="checkbox"/> GPO 3/4
		<input checked="" type="checkbox"/> SEC ADV	<input checked="" type="checkbox"/> KNK RT	

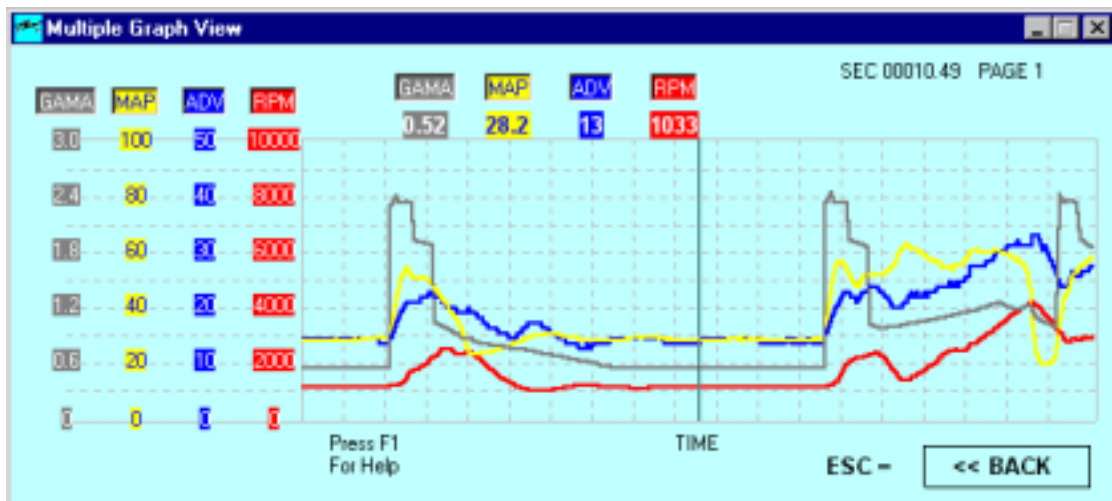
View Data Make sure NUM-LOCK is OFF << BACK

You can choose from 1 to 16 of the available traces in Single Graph Format and extract exact information on each of the traces and the time that each event occurred. On the View Data Setup screen, check each of the traces that you wish to view. Low Resolution screens like 640 x 480, you may only get 6 traces to view at any one time. After the traces are displayed, you can use the arrow keys to move a time cursor around the graphs. In each box you will see the actual reading at that exact moment in time. Each of the Window graphs can be moved to different places on the screen so that you can customize your display. When you leave this routine and come back at a later time all of the graphs will be in the same position as they were in the last session. Press the 'F1' key to display the Help Screen with all of the Keyboard Commands.

Trace Graphs



Multi Graph Overlay



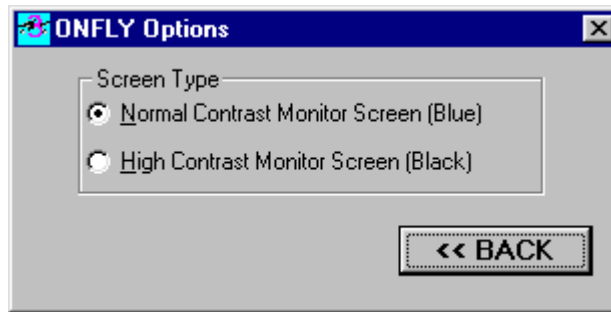
You can choose 2 to 4 traces in Multi Graph Overlay. This graph gives the tuner the ability to look at several graphs at one time and compare all of the traces in time synchronization. Each trace has its own scale and data display and the single line cursor can be moved just like the single graphs. Press the 'F1' key to display the Help Screen with all of the Keyboard Commands.

Keyboard Commands

Left arrow	1 move left
Right arrow	1 move right
Up arrow	10 moves right
Down arrow	11 moves left
Page up	moves forward one Page
Page down	moves back one Page
C	Center
Home	Start of file
End	End of file

The EGO Correction window in View Data has been changed to Percentage Value and created a new scale based on Authority Range. Because the format has changed you will not be able to view old 'DAT' files. Authority Range was added to DAT file header for EGO Correction scaling.

Options



The Options Menu lets the user select Engine Monitor Type and Screen type. The Engine Monitor selections are ONFLY Real Time Editing with Digital Monitor or Standard Editing mode with Analog Monitor. Screen Type lets you select the Monitor Contrast for both Monitors of either Normal or High contrast based on the screen appearance in high sunlight conditions.

DEFAULT SCREEN SETTINGS:

The number of graph windows displayed at startup of View Datalog routine is determined by the size of your Monitor as shown in the table below:

- 640x480 = 1 to 6 graphs
- 800x600 = 1 to 8 graphs
- 1024x768 = 1 to 15 graphs
- 1280x1024 or greater = 1 to 16 graphs

For Best Results use the small screen fonts.

Software Tools

Selecting the "Software Tools" button will bring up the WinTEC3 Software Tools menu. The Current Selections available on this menu are:

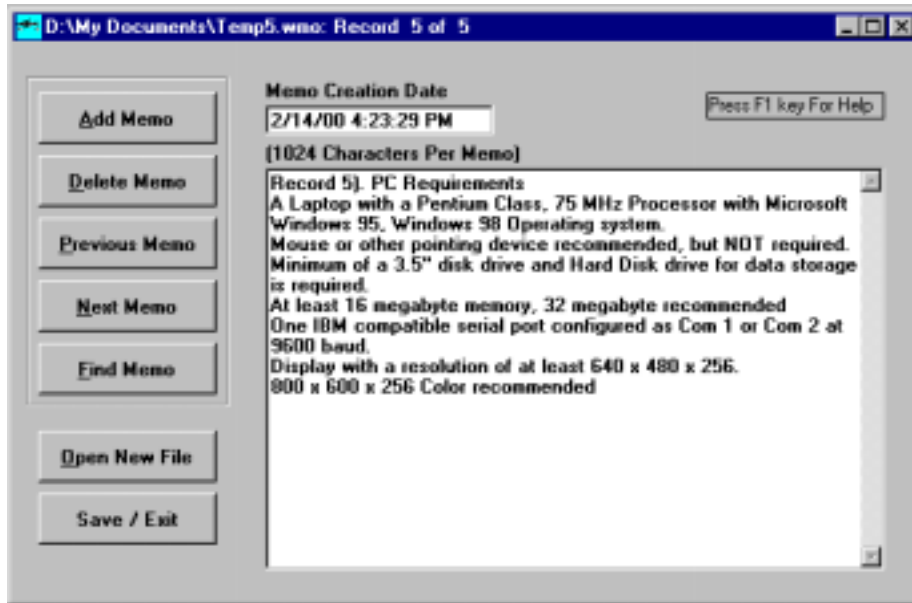
Calculator



The WinTEC3 Calculator has several unique features that are needed for the WinTEC3 software configuration. First, beside the common features of a standard Calculator, it can Add, Subtract, Multiply, and Divide Percents.

This is needed when determining the correct advance values for the advance tables (etc). The Calculator also gives you Square Root Calculations at a touch of a button. Other fast calculations maybe added later.

Memo Pad



When you enter Memo Pad for the first time, you will be asked to enter a filename with the '.WMO' extension. (No need to enter the extension). After the file is opened the user will be set at the last data record to be entered. When the user finishes entering new data, pressing the "Add Memo" button will save the current record and then set the user to the next blank record. Any record can be deleted by selecting the record you wish to delete and pressing the 'Delete Memo' button. To move backward in the file press the 'Previous Memo' button and to move forward in the file press the 'Next Memo' button. To locate a record, press the 'Find Memo' button and enter the Date the record was created in the 01/22/99 format. The program will search from the beginning of the file to the first match found. To close the current memo file and open another Memo file, use the 'Open Memo' button. When you are ready to save the memo file and exit, press the "Save/Exit" button. Use the 'F1' key to display the Memo Help file on screen.

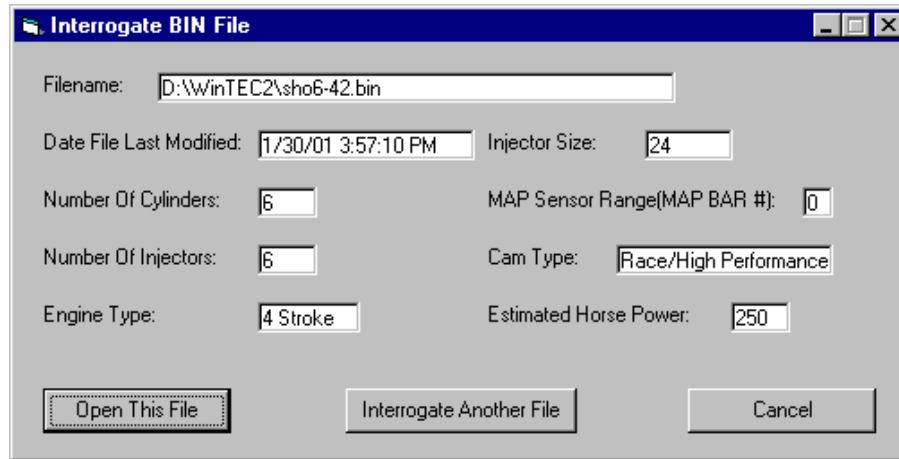
View Software User's Guide

This Selection lets the Tuner View the Text version of the "WinTEC3 Software User's Guide". It can be printed on the system local printer or viewed from within the WinTEC3 program. This should be the first file that you read when you start WinTEC3.

Print Calibration File

Selection of this function will allow you to print out the currently valid calibration data file. The calibration will be four pages long and if the Wizard is completed before the printout, the vehicle name field will also be printed at the top of each page. A print out of the base calibration as supplied with your software should be kept in your files for quick reference.

Interrogate BIN File



The File Menu Option “Interrogate BIN File” allows the user to view key file data so that the user can decide if the file is the one that is needed to tune the vehicle that is currently connected to the user’s PC. One helpful way of keeping track of old files is to use Long File Names. With Windows the user can give a bin file a name that is very descriptive of the kind of vehicle that the TEC unit is installed in (i.e. Ford Mustang GT 1996.bin).

To Print Out a Graphics Screen

Each of the Forms can now be printed from the WinTEC3 program by pressing the “PRINT FORM” button on each window. This feature requires a graphics capable printer connected to the PC/Laptop computer.

Downloading Data Into Other Spreadsheets

TEC stores the data in ASCII format that can be imported into spreadsheets. You may need to run an import or conversion utility in your spreadsheet to bring it in. The data is set up in columns with the first column being seconds. The columns are arranged as follows:

The first two lines of the file are header data.

Column	Data
Bytes 0-1	= RPM Data
Byte 2	= Advance Data
Byte 3	= Map
Byte 4	= Coolant
Bytes 5-6	= Total FPW Data
Byte 7	= Knock Data
Byte 8	= MAT Data
Byte 9	= TPS Data
Byte 10	= Battery Volts
Byte 11	= Sensor Flags
Byte 12	= GPO1 Data
Bytes 13-14	= Scaling Data
Byte 15	= ACTUAL AFR Data
Byte 16	= EGO Correction
Byte 17	= Desired AFR
Byte 18	= ARF Monitor Updates
Byte 19	= EGO Volts
Byte 20	= TBS Offset Data
Byte 21-22	= Staged PulseWidth
Byte 23-24	= PulseWidth
Byte 25	= AD Input # 1 Data

Byte 26	= AD Input # 2 Data
Byte 27	= AD Input # 3 Data/Speed
Byte 28	= AD Input # 4 Data/Speed
Byte 29	= GPO2 Data
Byte 30	= GPO3/4 Status& Control Data
Byte 31	= Trailing Advance Value
Byte 32	= Knock Retard Value

These files are large and it may be wise to just import interesting sections to investigate.

Installing a WinTEC3 Icon On the DeskTop

When you first install WinTEC3 on your system, you will be asked to install a DeskTop Icon at Installation. If you do not install an Icon at that time, then you can create a WinTEC3 icon on the DeskTop later by pressing the Start button on your DeskTop and go to the "WinTEC3 3.0.0 Engine Control Software" label which will expand to "WinTEC3". At this point Right Click on "WinTEC3" and press the "Create Shortcut" menu item. This will display two Shortcuts' of "WinTEC3" label on the Program List. Click on the second Shortcut while holding the Left mouse button down and drag the Shortcut Icon to the DeskTop. This DeskTop Icon will make the WinTEC3 loading process a lot faster.

Display Files and DOS Access

DOS Access is No longer needed because the Windows 95/98/NT user can view files at anytime by minimizing the application and displaying the directory by clicking on the "My Computer" Icon on your Desktop or use the Menu selections available with WinTEC3.

Exiting WinTEC3

At the bottom of each WinTEC3 screen is the "<< BACK" command button that if pressed will close the currently open screen and open the previously opened screen. You can also use the "ESC" key to exit the current window all the way to the Main Menu of the program just by pressing the "ESC" key. Entering the final "ESC" will bring up a request to Save any changes made to the Tables during the last editing session.

Electromotive, Inc.
9131 Centreville Road
Manassas, VA. 20110
PH# (703) 331-0100
FAX (703) 331-0161
E-mail <tecinfo@electromotive-inc.com>