



**DURAMAX DIESEL TUNER
QUICK START GUIDE**

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Introduction

The Wester's Garage Duramax Diesel Tuner package is a set of two programs that allow you to quickly and easily make calibration changes to your OBDII GM diesel truck and the interface to connect your PC to the vehicle. The PCM Programmer is used to read and program your vehicles PCM (Powertrain Control Module) and the Duramax Diesel Tuner program is used to view and edit the various calibration parameters.

Minimum PC Requirements

While the Duramax Diesel Tuner program will run on virtually any PC running Windows 95 or later, we recommend the following minimum PC specifications:

- Pentium 266
- Windows 98
- 64 MB RAM
- 600 x 800 display resolution
- 20 MB free hard drive space
- 1 serial port

Program Installation

To install the Duramax Diesel Tuner and PCM Programmer, insert your Wester's Garage DD Tuner CD into your CD ROM drive and run the setup program in the root folder (ddt_setup). This setup program will install both the DD Tuner and PCM Programmer on your PC. Follow the on-screen directions to complete the installation.

Program Registration

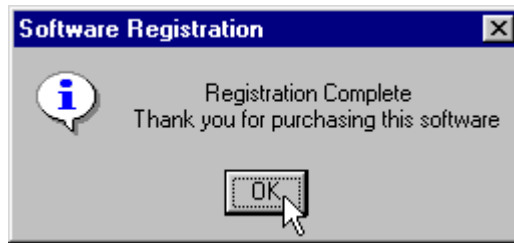
To use this program you will need to register it first. Your registration information is located on the label on the back of the CD case.

To register, run each program. When the program starts up, the registration screen will be displayed.

Enter your Customer ID and Serial Number from the label on the CD case into the appropriate boxes and click on the 'Register' button to complete the registration. If you have entered the information correctly, you will receive a message saying that the registration has been successful.



The screenshot shows a Windows-style dialog box titled "Registration". The main heading is "SOFTWARE REGISTRATION" in red. Below it, blue text instructs the user: "To register this software enter your Customer ID and Serial No. below and click on the Register button:". There are two input fields: "Customer ID:" and "Serial Number:". Below the fields, blue text provides contact information: "If you did not receive your registration information please contact us at: Wester's Garage, 218 Centre Street Box 159, Tilley, Alberta Canada T0J 3K0, nwester@eidnet.org". A note at the bottom says: "Be sure to include the name of the software you are registering and your e-mail address for faster response." At the bottom of the dialog are two buttons: "Register" and "Abort". A mouse cursor is pointing at the "Register" button.



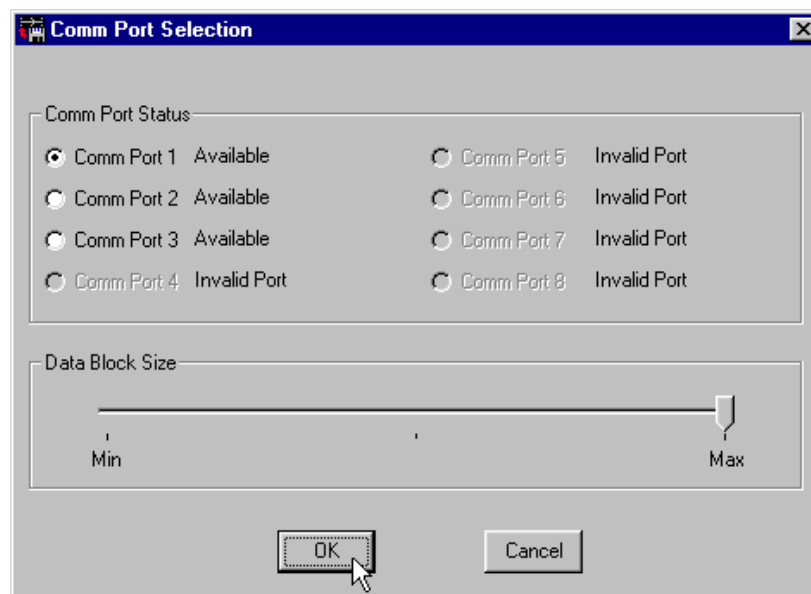
If you receive a message that says the registration was not successful double check you registration information and try again. Remember that both the Customer ID and Serial Number are case sensitive.

PCM Programmer Setup

Before proceeding be sure you have specified the correct Comm port that you will be using to communicate with the PCM. To set the correct Comm port, select '*Comm Port*' from the '*Setup*' menu.

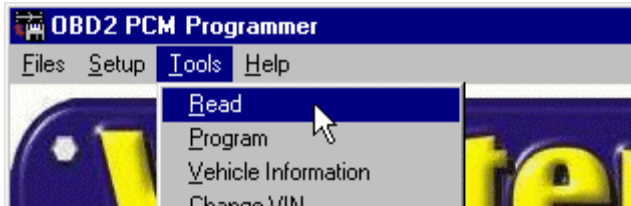


This will display the following screen:



Select the Comm port you wish to use and click 'OK'. The program will save this selection so you don't have to set the Comm port again unless you want to change to a different port.

Reading The PCM

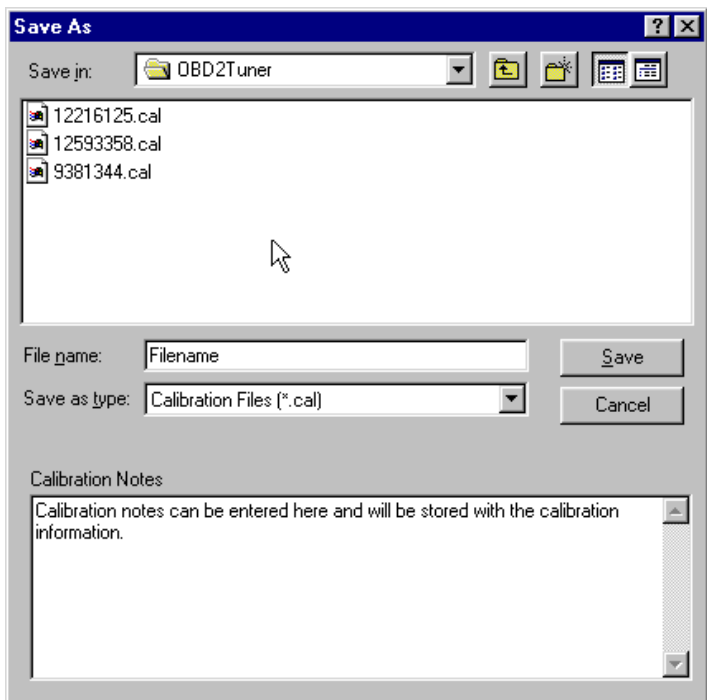
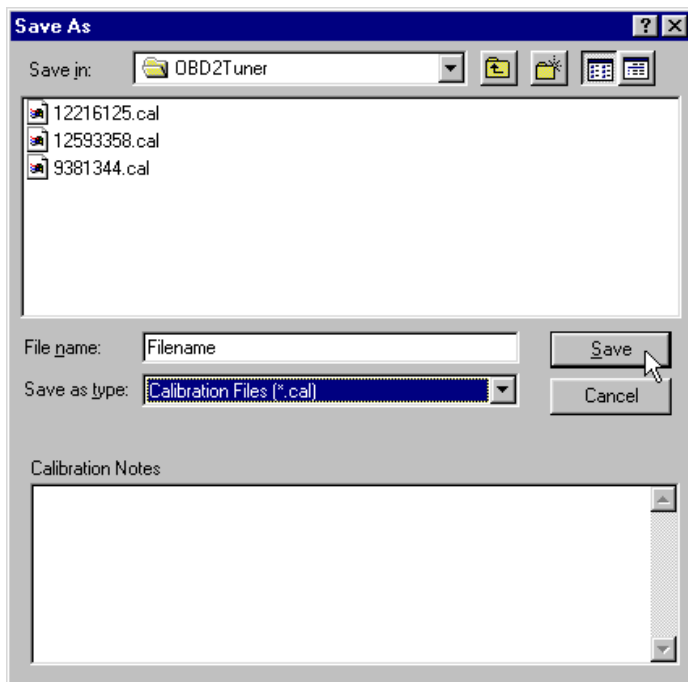


To read the calibration currently stored in the PCM, select 'Read PCM' from the 'Tools' menu.

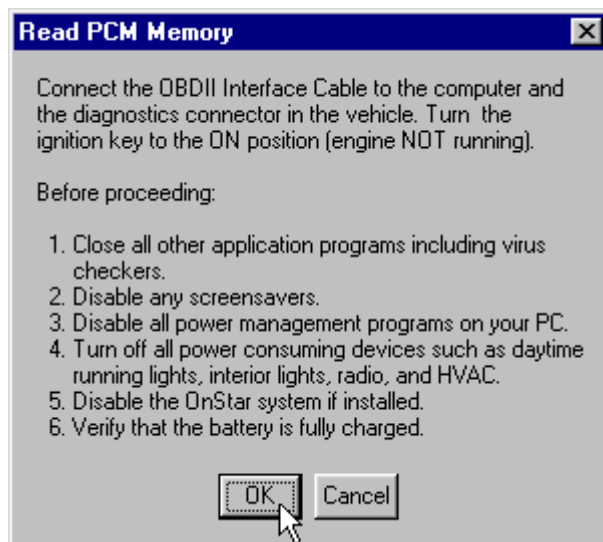
The program will then ask for a file name to give to the calibration file that will be created when the PCM is read.

Type in a valid name for your calibration file into the 'File name:' box and click on the 'Save' button to continue.

You can add calibration notes to your calibration file by typing the notes into the 'Calibration Notes' box in the lower half of the screen before clicking on the 'Save' button. These notes will be saved with the calibration information.



After clicking on the 'Save' button the read PCM start screen will appear.



Before proceeding, connect the RS-232 to OBDII converter interface to the Comm port on your PC. If your PC has more than one Comm port, make sure you connect the converter to the com port that you specified on the Comm Port Setup screen.

Connect the other end of the converter to the ALDL diagnostics connector on the vehicle.

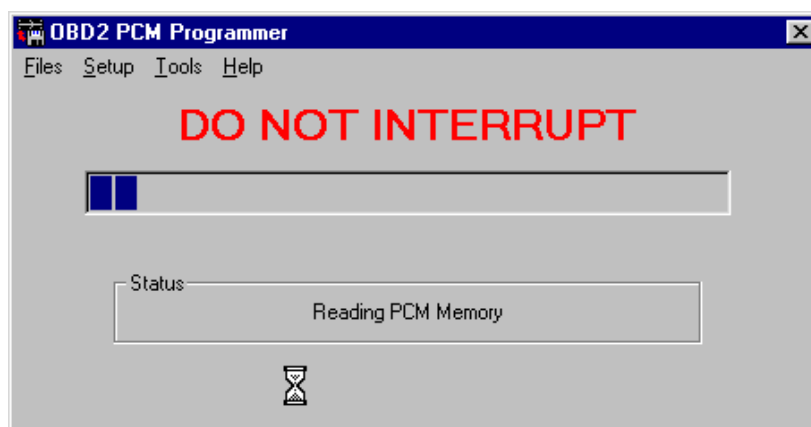
Once the cable is connected, turn the ignition key on but DO NOT start the engine. After turning on the ignition, wait about 10 to 15 seconds to clear the GM security delay before proceeding with reading.

Before proceeding:

1. Turn off all power consuming devices such as day time running light, interior lights, entertainment systems, etc.
2. Make sure your battery is fully charged. Do not attempt to read the PCM with a battery charger connected.)
3. Disable the OnStar system if installed

Now click on 'OK' to begin the PCM read process. If all the connections have been properly made, the program will begin communicating with the PCM, sending the necessary instructions to start the memory read process.

The following status window will be displayed during the read process:



The progress meter shows the progress on the reading of the PCM as it proceeds and the Status window describes what part of the process is currently underway. Depending on the type of vehicle and the PC you are using, the read will usually take about four minutes.

When the FLASH read process is complete, the message shown below will be displayed:




Click 'OK' to complete the PCM read and close the Read Complete message box. The calibration information from your PCM will now be stored on your PC.

Editing Calibration Files (Tuning)

Now that you have a copy of the stock calibration that you can view and edit as needed. You will use the Duramax Diesel Tuner program to view and edit your calibration files. To begin tuning, run the Duramax Diesel Tuner program.

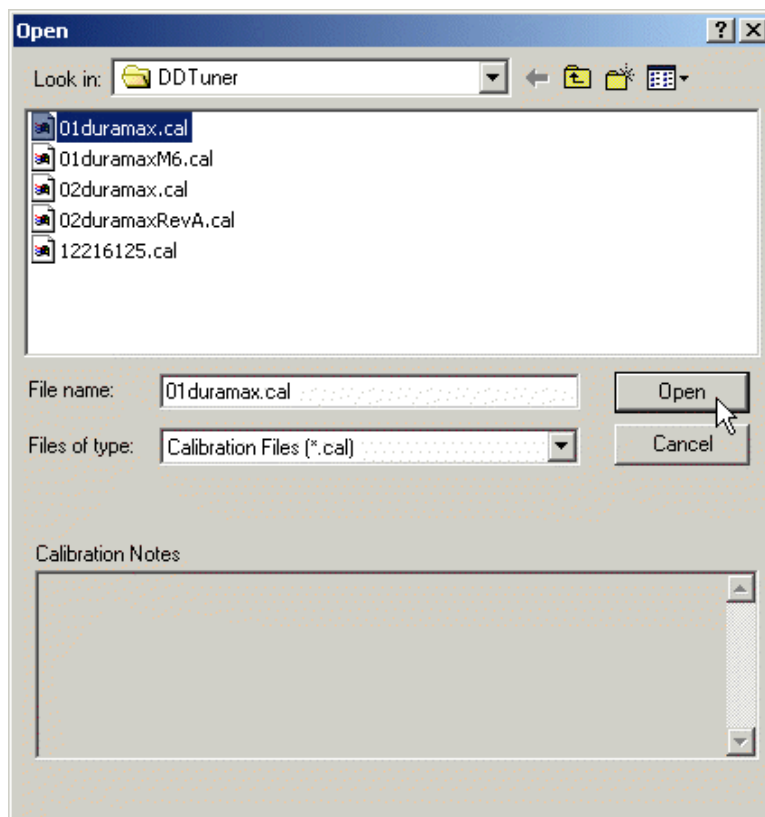
Opening A Calibration File

To open a PCM Calibration file select 'Open File' from the *File* menu or click on the Open File  button on the tool bar at the top of the screen.



This will display the 'Open File' dialog box. Select the desired file and click the 'OK' button.

Select a calibration file and click on the 'Open' button to load the calibration file into the Duramax Diesel Tuner program. When you click on a calibration file name in the Open File screen, any notes that have been saved with the calibration file will be displayed in the Calibration Notes box at the bottom of the screen.



Editing A Calibration File

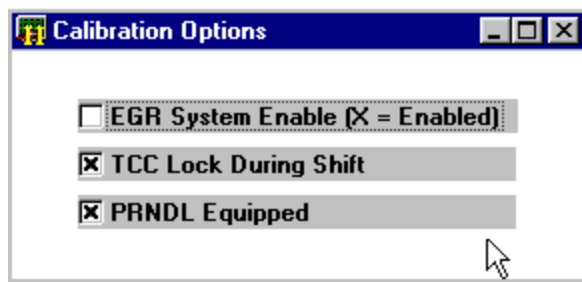
Once you have loaded a calibration file into the Duramax Diesel Tuner program you are ready to begin tuning by editing the various calibration parameters.

Calibration Parameters

The Duramax Diesel Tuner program uses four different formats of calibration parameters to display the various calibration values.

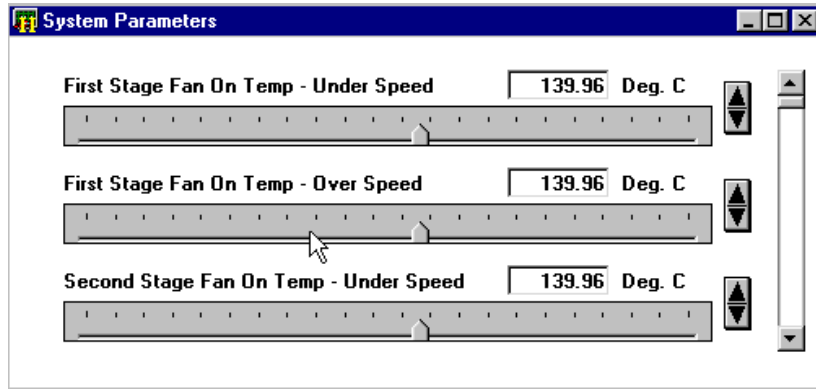
Switch Type Calibration Parameters

The switch type calibration parameters are values that have only two states such as on or off, or Enabled or Disabled. This type of parameter will include calibration items such as 'EGR System Enable'.



Constant Type Calibration Parameter

Constant parameters represent single values or calibration constants such as the fan on temperature.



2D and 3D Calibration Tables

Calibration Tables are used to display a series of values that depend on one (2D tables) or 2 other parameters (3D tables).

An example of a typical 2D table would be the Knock Attack Rate Vs. RPM.

The screenshot shows a window titled "Knock Fast Attack Rate vs. RPM" containing a 2D calibration table. The table has two columns: "RPM" and "Deg/msec".

RPM	Deg/msec
0	0.213
400	0.222
800	0.240
1200	0.240
1600	0.249
2000	0.293
2400	0.311
2800	0.329
3200	0.329
3600	0.320
4000	0.320
4400	0.320
4800	0.391
5200	0.391
5600	0.391
6000	0.391
6400	0.391
6800	0.391
7200	0.391
7600	0.391
8000	0.391

A good example of a common 3D table would be the Spark Advance versus Load versus RPM table.

Spark Advance Vs. Load Vs. RPM, Open Throt, Low Oct.						
gm/cyl	RPM					
	400	600	800	1000	1200	1400
0.08	18.00	18.00	28.66	39.32	44.24	48.33
0.12	18.00	18.00	27.27	36.55	40.81	43.69
0.16	18.00	18.00	26.02	33.67	36.84	39.45
0.20	18.00	18.00	24.70	30.59	33.45	35.78
0.24	18.00	18.00	22.64	27.63	30.26	32.48
0.28	16.26	18.00	20.04	24.73	27.32	29.49
0.32	11.91	15.63	18.92	21.91	24.53	26.59
0.36	8.48	12.33	15.74	18.59	21.14	23.32
0.40	4.86	8.90	12.51	15.12	17.80	20.09
0.44	1.12	5.41	9.23	11.63	14.48	16.92
0.48	-2.64	1.89	5.91	8.20	11.21	13.85
0.52	-6.31	-1.60	2.57	4.86	8.02	10.81
0.56	-9.80	-5.05	-0.79	2.22	5.54	8.44
0.60	-13.08	-8.42	-4.20	-0.40	3.03	6.07
0.64	-16.11	-11.60	-7.63	-3.96	-0.64	2.40
0.68	-18.81	-14.73	-11.08	-7.74	-4.62	-1.71
0.72	-21.14	-17.74	-14.64	-11.74	-8.99	-6.35
0.76	-24.02	-20.00	-18.00	-15.41	-12.01	-10.24

Rotate Graph

To rotate a 3D graph, hold down the 'Shift' key and the left mouse button and drag the mouse to rotate the graph. Moving the mouse up and down rotates the graph about the x axis; moving the mouse left and right rotates the graph about the z axis; and moving the mouse diagonally rotates the graph about the y axis. Rotating the graph will allow you to view and edit points that would otherwise not be visible.

Zoom Graph Window

To zoom in on a particular area of the graph, hold down the Control key and the left mouse button and drag the mouse over the area to zoom. Press the 'R' key to return to the original zoom level.

Move Graph

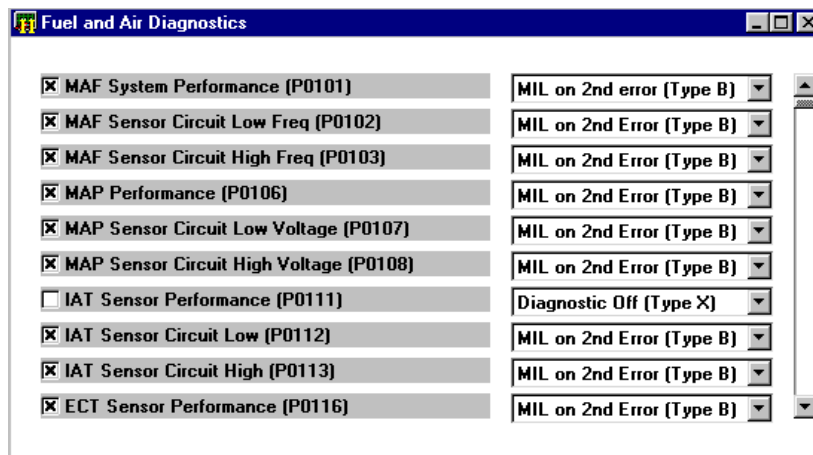
To move the entire graph within the table window, hold down the 'Shift' key and the right mouse button and drag the graph in the desired direction.

Scale Graph

To scale the entire graph, hold down the 'Alt' key and the left mouse button and drag the mouse to make the graph bigger or down to make the graph smaller.

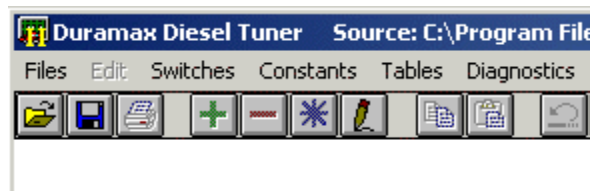
Diagnostic Type Calibration Parameters

The diagnostic type calibration parameters are parameters that control the operation of the OBDII diagnostics.

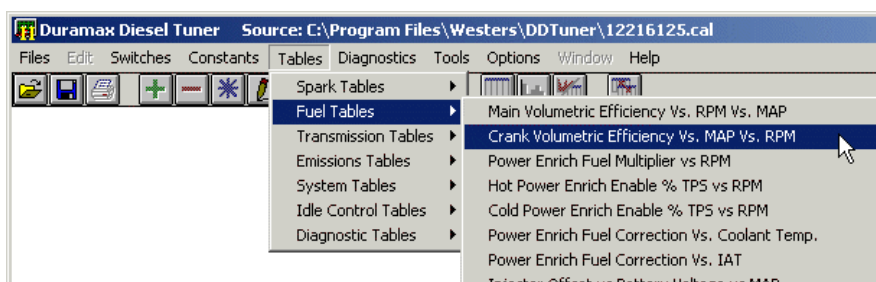


Accessing Calibration Parameters

The calibration parameters are grouped by the parameter type as described above. To view and edit the various calibration parameters, select the type of parameter you want to work with by clicking on one of the calibration parameter menus at the top of the Duramax Diesel Tuner program screen.



For example, to view table parameters, click on the 'Tables' menu. The table parameters are then arranged in sub-groups according to function. When you click on one of the calibration parameter menus the sub groups are then displayed.



To select the sub group you are interested in click on the sub group name to display all the parameters in that sub group.

To make the calibration parameters easy to understand and more convenient to edit, the Duramax Diesel Tuner program displays all table values in correct engineering units rather than the binary values actually stored in the calibration file.

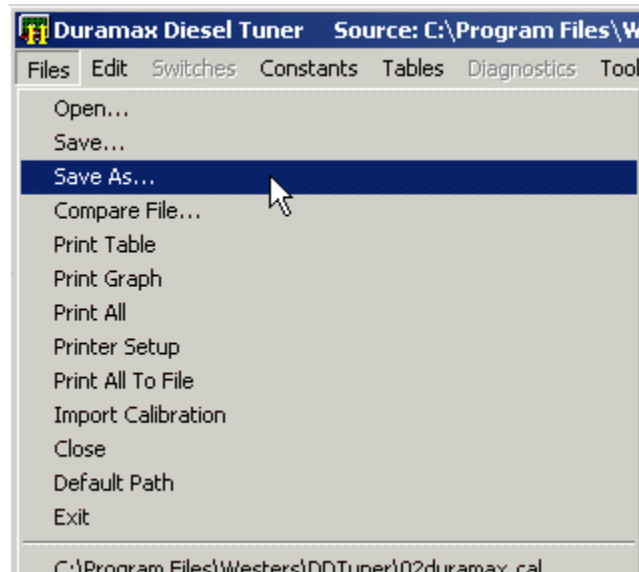
You may view as many tables at once as you want. To view another table, simply select it from the menus. To close a table, click on the window close box (X) in the upper right hand corner of the table.

Note: You will **NOT** lose any changes that have been made to a table by closing it.

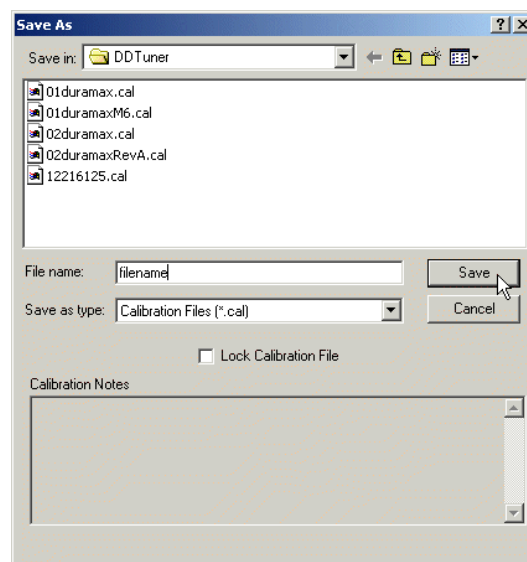
The displayed table can be sized in height or width by clicking on an edge and dragging it to the desired size. Use the 'Windows' menu to arrange the tables you have open.

Saving a Calibration File

Once you are finished editing the calibration file you need to save it. To save the edited calibration file to a different file so you don't over-write the original calibration file, select 'Save As' from the 'Files' menu.



This will display the 'Save As' dialog box. Select another file or type in a new file name and click the 'Save' button.

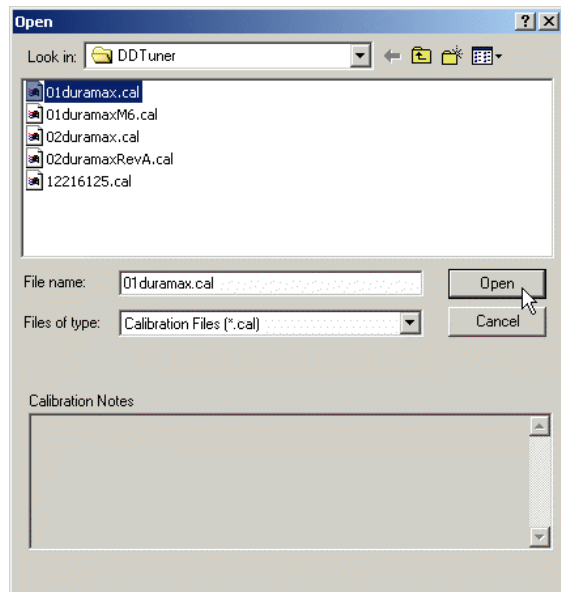


Programming the PCM

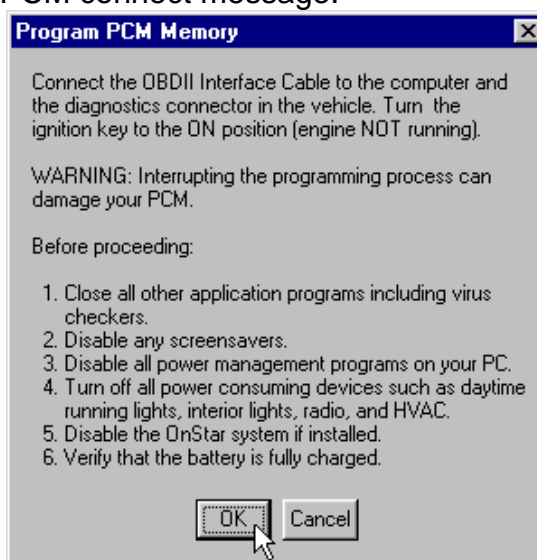
To install a new calibration you need to program the new calibration into your vehicle's PCM. This is done using the PCM Programmer.

Run the PCM Programmer, click on the 'Tools' menu and select 'Program PCM' from the drop-down list.

An Open File dialog screen will then be displayed as seen on below.



Click on the file you want to use to program the PCM and then click on the 'Open' button. This will display the Program PCM connect message.



WARNING

If the programming process does not complete successfully it is possible to damage the PCM. Under no circumstances should you interrupt the programming process once it is started.

The following are recommendations for the successful programming of your PCM:

- Before programming the PCM, make sure you can successfully read the PCM. This is a very similar process and if that is successful, then the programming should also work fine. YOU CAN NOT DAMAGE YOUR PCM BY READING IT.
- Make sure the car battery is in good condition and fully charged. DO NOT try to program the PCM with a battery charger connected to the car battery. The correct range of the battery voltage for PCM programming is relatively narrow.
- If you're using a laptop, make sure the laptop battery is fully charged.
- Make sure you have good connections between the PC, ALDL connector and the interface cable and that they are not likely to be unintentionally disconnected during the programming process.

- Disable all power management functions on your PC.
- Disable all screen savers on the PC.
- Make sure there are no other applications (programs) running on your PC, including virus checkers – use the antivirus from <http://www.free-av.com>. Other anti-virus programs seem obtrusive.
- Turn off all power consuming devices such as day time running light, interior lights, entertainment systems, etc.
- Make sure your battery is fully charged. Do not attempt to program the PCM with a battery charger connected.
- Disable the OnStar system if installed.

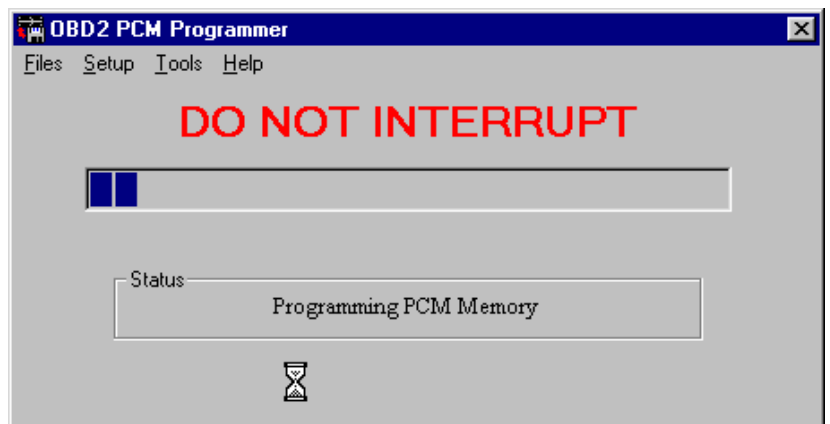
Before proceeding, connect the RS-232 to OBDII converter to the Comm port on your PC. If your PC has more than one Comm port, make sure you connect the converter to the Comm port that you specified on the Comm Port Setup screen.

Connect the other end of the converter to the ALDL diagnostics connector on the vehicle.

Once the cable is connected, turn the ignition key on but DO NOT start the engine. After turning on the ignition, wait about 10 to 15 seconds to clear the GM security delay before proceeding with programming.

Now click on 'OK' to begin the PCM programming process. If all the connections have been properly made, the program will begin communicating with the PCM, sending the necessary instructions to start the memory programming process.

The programming status screen will then be displayed (right).



The progress meter shows the progress on the programming as it proceeds and the Status window describes what part of the process is currently underway. Depending on the PC you are using, the programming will usually take minute or two.

When the programming process is complete, the message shown (right) will be displayed:

Click 'OK' to complete the PCM programming and close the Programming Complete message box. Your PCM is now programmed with the new calibration and ready for testing.



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