



## CALC VET Summary Notes

Printable View

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WeathermanShawn

May 6th, 2011

CALC VET Summary Notes

### In-Memory-of-Shawn-Sankey

#### **Tuners Checklist:** [Mechanical-Issues-that-prevent-Good-Tuning](#)

#### **I. Validate Pids:**

1. Connect Scan Tool to your Vehicle (Select Controller)
2. Turn Ignition Key to 'On'
3. Scan Tool>>Info>>Validate Pids

#### **II. Scan Tool Set-Up**

##### **1. Creating Pids**

<http://download.efilive.com/Tutorials/Interactive/How to Create a PID List.htm>

##### **2. Creating Maps**

<http://download.efilive.com/Tutorials/Interactive/How to Create a Map.htm>

##### **3. How to copy and paste.**

<http://download.efilive.com/Tutorials/Interactive/How to Copy and Paste with AutoVE.htm>

##### **4. Map Filters**

<http://download.efilive.com/Tutorials/Interactive/How to create a filter.htm>

**Note:** when copying a map from the scantool, always use copy-with-labels, and then in the tunetool use paste-with-labels or paste-multiply-with labels (whichever is appropriate) to modify the target table.

#### **III. CALC.VET Tuning Tips**

##### **1. B0701:** Disable Catalytic Converter Protection

Insures accurate stoich and PE mode/WOT Fueling

##### **2. B0120:** Change RPM Threshold for Airflow Calculation from 4000 to 400

Eliminates any Airflow Correction from the VE Table

##### **3. B3308:** Disable DFCO: Change **B3308** (M6) to 140C Change **B3313** to 140C

Accurate fueling computations

##### **4. B4105:** O2 Switch-points to 450 Millivolts

Smoother MAF & VE Table

##### **5. B3618:** PE Modifier Based on Rpm (EQ): 1.16

Safe adequate Fueling regardless of Fuel Type

##### **6. B3616:** PE Enable: make sure PE enables as load becomes significant

(e.g. below 60% TP below 3200 rpm, 35% TP above 3200 rpm).

##### **7. B3608 and B3609:** PE Delay: set these to zeros.

## IV. Logging Techniques:

45-60 minute log is best. Allow Engine to warm to normal operating temperatures before logging. Include Idle, cruise, acceleration, deceleration, and WOT. Apply as much **steady** throttle as possible. Avoid 'jackrabbit' starts and rapid braking. Use lower gears to hit higher Rpm's and lower Maps if desired.

### PE Mode/WOT:

PE Mode is best performed utilizing 100% TPS (WOT). This is because a number of Fuel Dynamic Parameters are kept steady and constant (evaporation, cylinder wall-wetting, etc). Also, a steady 100% TPS insures accurate computation of the MAF Airflow. Avoid part-throttle PE Mode Tuning.

## V. Blend MAF and VE Tables

The first time you are Tuning via **CALC.VET** you will be pasting your new Values into **B0101**. You must 'blend' those values into your existing VE Table. Manual smoothing is superior to 'computer' smoothing. However, the first few logs it may be appropriate to utilize the **EFILive** 'Smoothing' Tool. You may also smooth using the 'Smooth cells without decreasing the min/max range' Smoothing Tool alone or in combination with the above Smoothing Tool.

### Tips for VE Table Smoothing:

1. Adequate Cell Count (45-60 minute log).
2. Proper Data Filters
3. Steady State Throttle
4. Driving techniques.
5. VE Table Values generally rise as Rpm's, MAPS increase. The peak VE Values will mimic your Torque curve. For a LS1 highest VE Values are generally found at 4800-5200 Rpm's.
6. Eliminate Spikes.
7. Manually interpolate for areas you can not hit. This is essentially important for RPM's below Idle (400) and above 6400 Rpm's..

### Blended VE Table B0101:

*Normalized to 100%.*

<http://i1126.photobucket.com/albums/.../DVEtable-2.png>

*Note: General VE Table Smoothing Rule: VE Values almost always increase with RPM/MAP*

### MAF Table Smoothing:

Normally the MAF Curve will slope exponentially from 1500-12,000 Hz in a smooth fashion. You can view this on the Two-Dimensional chart found on Table **B5001**. Occasionally when logging **SELBENS** the MAF Curve can become a little jagged. You might want to manually 'smooth' those cells using the two-dimensional graph. You want to eliminate spikes and keep the curved function relatively smooth.

The second technique is average your existing **SELBENS** over the entire curve. This insures a natural slope and will produce better results.

### Blended MAF Table B5001

<http://i1126.photobucket.com/albums/.../MAFFreq-3.png>

*Note: Keep this MAF Curve as smooth as possible. No jagged points or spikes.  
You must extend the MAF Curve to 12,000 Hz for accuracy.*

### Closed-Loop MAF Tuning/Blending (No Wideband):

When performing a Closed-Loop MAF Calibration, normally only those MAF frequencies below 7000-8000 Hertz are adjusted. This leaves the MAF Frequencies above 7000-8000 Hertz totally 'uncalibrated'. A technique to estimate the upper portion of the MAF Curve is to add the Average of the LTFT1 and LTFT2 Banks (LTFTAVR), and apply that percentage to the upper portion of the MAF Curve. If done correctly the entire MAF Curve will have the same slope from 1500-12,000 Hz.

### Table B5001 Example

<http://i1126.photobucket.com/albums/.../MAFFreq-1.png>

*Note: Keep this MAF Curve as smooth as possible. No jagged points or spikes.  
You must extend the MAF Curve to 12,000 Hz for accuracy.*

## VI. Refining your CALC.VET Tune

1. Reset LTFT Trims: Connect Scan Tool to Vehicle >> Ignition Key On >> Calibration >> Long Term Fuel Trim Cells >> Reset

2. Eliminate Positive Trims:

The PCM will add Fuel to PE Mode/WOT if LTFT's are positive. You can eliminate them by adding +1 to +2.5% to All Values in the MAF Curve. Then Tune PE Mode/WOT using SELBENS.

3. Eliminate Knock Retard:

Best to use Dyno to find optimum spark and eliminate KR. For street, eliminate KR by reducing Spark to a value -2 below KR threshold.

Example LS1 Spark Table: [Idle-Tips-amp-Tricks](#)

4. Idle:

See LS1 Idle Tips & Tricks: [Idle-Tips-amp-Tricks](#)

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WeathermanShawn

May 17th, 2011

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### AUTOVE, AUTOMAF, CALC.VET, CALC. MAFT:

#### Serial wideband:

anywhere that a BEN is required, use this as the new BEN:  $WO2BEN = \{GM.EQIVRATIO\} * \{EXT.WO2LAM1\}$ ;

(i.e. change any BEN maps to use this and save with new filename).

Shawn's **Calc.VET Tutorial** and **Calc.MAFT Tutorial** contain [calc\\_pids.txt](#) files that define [WO2BEN](#).

#### AutoVE:

- disable CL/LTFT,
- disable MAF (make sure MAF DTC is present),
- set PE safely rich to protect motor,
- capture log,
- create a [WO2BEN](#) map that matches [B0101](#) (hint: copy the [VE](#) table, then in the map row/col properties click Paste Label),
- apply transient filter to map,
- paste-multiply map to [B0101](#).

#### AutoMAF:

- disable CL/LTFT,
- enable MAF (make sure DTC goes away),
- set [B0120](#) to zero to disable VE,
- set PE safely rich to protect motor,
- capture log,
- create a [WO2BEN](#) map that matches [B5001](#) (hint: copy the [MAF](#) table, then in the map row/col properties click Paste Label),
- apply transient filter to map,
- paste-multiply map to [B5001](#).

**Shortcut:** while doing AutoVE, log GM.DYNAIR, and make a B5001-like map of GM.DYNAIR multiplied by [WO2BEN](#), filter transients, paste into [B5001](#).

#### Note:

- AutoVE is a special case of **Calc.VET Tutorial** with CL/LTFT and MAF disabled.
- AutoMAF is a special case of **Calc.MAFT Tutorial** with CL/LTFT and VE disabled.
- **Calc.MAFT Tutorial** is aka **Reverse Calc.VET Tutorial**.

#### SELBEN:

SELBEN is a combination of [LTFT](#) and [WO2BEN](#), but you can restrict SELBEN to only [WO2BEN](#) (i.e. wideband only) as long as you disable CL/LTFT.

#### Concept:

- **Calc.VET Tutorial** corrects MAF and calculates VE from corrected MAF.
- **Calc.MAFT Tutorial** corrects VE and calculated MAF from corrected VE.

**Pay careful attention to:**

- is PE safely rich to protect motor,
- is PE enabled correctly to kick in at any significant load,
- is CL/LTFT enabled/disabled,
- is MAF enabled/disabled,
- is VE enabled/disabled,
- what am I using for BEN,
- did I apply the transient filter,
- avoid using GM.AFR for anything other than display,
- keep pid **channel** count at 24 or less.

Author: **Joecar** EFILive Forum Moderator.

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joecar

May 17th, 2011

Everyone/Anyone: please take the time to read the Summary Notes... they will save you from getting into a hole.

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Taz

May 17th, 2011

Just copied post #1 in it's entirety into a Word document ... into the tuning binder it goes ...

Thanks to WeathermanShawn and Joecar for conceptualizing / developing / implementing this tuning method.

Cheers,  
Taz

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joecar

May 17th, 2011

Thanks to Weatherman for thinking it up, putting it down in writing, and refining the written materials :cheers:

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joecar

June 24th, 2011

The relationship between Calc.VET, Calc.MAFT, AutoVE, AutoMAF is in this thread: [AutoVE-questions](#)

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WeathermanShawn

June 24th, 2011

**Joecar**, I liked your Summary so much, I put it post 2 of the **CALC.VET Summary Notes:** <http://forum.efilive.com/showthread....l=1#post145259>

Perhaps the next project would be a Thread/Summary: Which Tuning Method do I use..**AUTOVE**, **AUTOMAF** or **CALC.VET**..it could have a description of each Tuning method..advantages, disadvantages, etc..Then an user could have more information to help decide.

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joecar

June 24th, 2011

Shawn, thanks :) I knew you would like it :cheers:

I saw people asking what is the difference between all the tutorials so I needed a summary to explain

everything  
[ notice I applied what we learnt about PE :) ]

I edited post #2 to correct some typos :doh2:

Quote:

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*Originally Posted by **WeathermanShawn** »*

***I. Validate Pids:***

- 1. Connect Scan Tool to your Vehicle (Select Controller)*
  - 2. Turn Ignition Key to 'On'*
  - 3. Scan Tool>>Info>>Validate Pids[/COLOR][[/SIZE][COLOR=black]*
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Help please for a newbie from the UK... I get as far as 3. but my flashscan V2 has no >> info

my options are

F1 Select Pids  
F2 Data Logging  
F3 Scan Options

All times are GMT +8. The time now is 11:39 PM.

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