

Common Tuning Problems

VE Table Entries Maxed Out:

When calibrating the VE tables, occasionally the table values will max out. The best way to handle this problem is to increase the engine displacement setting constant. This affects many other settings, so if you anticipate this problem make the change early in the tuning process. Do not change the displacement any more than necessary to get the VE table into range. A good starting place would be to increase the displacement by 5 percent, and decrease both VE tables by 5 percent across the board. Rerun the VE table calibration and verify that the peak VE is now under the maximum limit.

If you are using a calibration that supports the EGR Effect tables (these are MT8 or later files) and the high VE values are at 60kPa or less, the recommended procedure is to adjust the EGR tables to reduce the VE value PRIOR to making any engine displacement setting changes.

Exhaust Popping on Deceleration:

Exhaust popping on deceleration is due to a too lean or too rich mixture in the exhaust. This can be caused by a leaky gasket, or by the AFR being set incorrectly by the ECM. Most commonly, the mixture will be too lean. The ECM has three tables which affect this: Decel Enleanment, the AFR table, and the VE table.

The Decel Enleanment only acts for a short time (ie 1-2 seconds) after the throttle is closed. To richen the mixture during this time, decrease the value in the table at the temperature the problem occurs.

To richen or enlean the mixture during the entire decel event, change the AFR table in the in the first column (20 kPa between 1750 and 3500 RPM by 5 to 10 percent. Some experimentation here will find the sweet spot that eliminates the popping.

In the past, others recommended to change the VE table values to eliminate this popping. This will also work, however since changing the VE table has many other effects on engine operation, we do not recommended it.

Tip: To determine the MAP and RPM that is causing the popping, use the following procedure to "mark" the data recording.

1. Set-up DataMaster to record generic or O2 data
2. When you are riding and the popping occurs, pull in the clutch and let the engine revs drop to idle
3. When you play back the data, look for the idle spot at speed. The MAP and RPM that caused the popping are right before this.

Another way to mark a recording is to pull the clutch in and rev the motor twice quickly. Find a method that works best for your situation!

Engine Runs Hot at Idle:

Many late model bikes run very hot at idle, and will overheat if stationary for too long a period.

The latest MasterTune calibrations have significantly improved heat management capability over the earlier and stock calibrations. It is recommended to use these calcs wherever possible, and enable the EITMS system if heat buildup during idle is a problem.

The EITMS system is an option on most calibrations. The EITMS system was developed to reduce heat buildup during prolonged idling times and controls heat buildup in two stages:

1. **Mode 1** – AFR Enrichment
2. **Mode 2** – Skip Fire

Mode 1 will be activated under the following conditions:

1. The engine temperature exceeds 142 °C (Sportsters 230 °C)
2. The Engine RPM is less than 1200 RPM

Mode 2 (Big Twins only) activates if **Mode 1** is active AND:

1. The engine temperature exceeds 155 °C
2. The vehicle speed is less than 1-2 KPH

Sportster temperatures are much higher due to the location of the temperature sensor and only uses EITMS Mode 1 (AFR/Lambda enrichment).

If the engine is still running excessively hot at idle, try the following:

- Turn off EITMS
- Richen the fuel mixture at idle speed and kPa
- Increase the timing in the idle region only

The idle region can be identified by monitoring the engine using DataMaster.

Electronic Throttle High Idle Speed:

The 2008 and later Electronic Throttle (ETC) bikes can develop a high idle speed over time. This is caused by the "auto learn" feature in the ECM that learns the Twist Grip Sensor (TGS) zero position when the bike is shut off. Many riders just flip the switch on the handle bar with their right thumb with the rest of the hand still on the throttle grip. This causes the Twist Grip Sensor to not be at zero and the ECM learns the new position, and little by little this causes the high idle issue.

To prevent this problem, always turn the engine off using the tank switch with your right hand. By removing your hand and shutting down using the tank switch you have to let go of the Twist Grip so it returns to the proper zero position prior to the power shutdown.

Computer Related Issues

Performance Notes:

Due to the highly graphical nature of MasterTune2 and DataMaster2, it is recommended that the PC have a good graphics capability and a dual-core or better processor. Additionally, if a laptop is used for on the road data collection a solid-state drive (SSD) is very desirable to prevent vibration-related problems. Using 2x the above minimum memory recommendations will generally show a noticeable performance improvement.

Display Problems:

Some customers have encountered display problems with MasterTune2-HD. This typically occurs if the Windows display scaling is set to greater than 100%. If MasterTune2-HD appears very small on your screen, or if text or buttons are cut off, click [this link](#) for instructions:

Slow Program Startup:

The first time a program is launched, it can take many seconds before the program shows on the screen. This is due to the system loading dependant resources from disk to memory, and "real time" virus scanning of the software. Subsequent program launches are typically much faster, as the resources continue to reside in memory.

The following items are the major causes of slow program startup:

- Virus Scan checking the program when launched: The solution is to add the program to the anti-virus program exception list. See your anti-virus provider for more details.
- Insufficient memory in the system. The guidelines outlined in System Requirements are considered minimum; systems with additional memory typically perform better.
- Excessive number of programs on the PC: The computer must sort through thousands of registry entries when launching a program. Removing unused programs can speed up this process noticeably.
- An excessive number of programs or tasks running in the background: The fewer, the better. Better hardware and later operating systems tolerate more background tasks. In general, it is best if there are 70 or fewer tasks. Removing unused or seldom used programs can make significant reductions in background tasks.

Program Fails to Launch After Installation:

This is generally due to an anti-virus product blocking or deleting the program when it was installed. This occurs if the AV program does not recognize the program or erroneously identifies it as "malware". Follow these steps to handle this situation:

1. Manually uninstall the program using Windows *"Add and Remove Programs"* feature
2. Disable the AV software protection
3. Reinstall the TTS program using the updater
4. Add the program's folder to the AV "exception" list
5. Re-enable the AV software

Consult with the AV manufacturer for specific details on how to disable AV protection and add files to the exception list.

Program Launches then Disappears:

This is usually caused by Windows Defender blocking the program. Use the following steps to add the TTS program folder to the Defender exception list:

1. Log into the Administrator account
2. Select *Start – Programs – Windows Defender* or type 'Defender' into the search bar
3. Select *Tools* and then *Options*
4. Scroll to the bottom of the page to *Advanced Options*
5. In the *"Do Not Scan these files or Locations"* box add the following entries:
 - C:\Program Files\TTS\DataMaster-HD\DataMaster-HD.exe
 - C:\Program Files\TTS\MasterTune-HD\MasterTune-HD.exe
6. Click *Save* to save the changes. Select OK if prompted to OK the changes
7. Close the Windows Defender application.

Locating the diagnostic port on your Harley-Davidson

The location of the diagnostic port on Harley-Davidson motorcycles varies from model to model and year to year, so be sure to double check your service manual for the correct location. In general the diagnostic port locations (as you are sitting on the bike) are as follows:

Touring Bikes:

Model years 2001 - 2007: on the **RIGHT** side behind the side cover in front of the saddle bags.

Model years 2008 - 2018: on the **LEFT** side behind the side cover in front of the saddle bags.

Softail Bikes:

All model years: under the seat.

Dyna Bikes:

All model years: on the **LEFT** side behind the rectangular cover below the seat.

V-Rod Bikes:

All model years: on the **LEFT** or **RIGHT** side behind the triangular cover between the frame and the forks.

XL (Sportster) Bikes:

Model years 2007 - 2018: on the **LEFT** side behind the side cover below the seat.

Street Bikes:

Model year 2015 - 2018: on the **RIGHT** side behind the side cover below the seat.