GEN4 PRO XTREME BigComm Pro High Speed Logger Menu User Manual

www.**BigStuffTPM**.com

Revision 3.0 | October 13, 2026

HOW TO USE THE BIGCOMM PRO HIGH SPEED LOGGER MENU

The **High Speed Logger** menu is used to configure the GEN4 PRO XTREME ECU functionality of the crank and cam sensors inputs. The menu is located in your project under the AFR tab between the Graphing and Logging section and Auto Tune. The crank and cam sensors are some of the most important signals that come into the GEN4 ECU as If they are not working properly your engine may not run and the ignition timing will not be synced correctly. In this section we will describe how to configure the crank and cam sensors using the Dealer Settings and calibrating the crank and cam signals.

If you are going to change any of these settings, then the Dealer Settings must be accessed to change the configuration. To enter the Dealer Settings first open the GEN4 software and choose your ECU in the Devices tab. Once your project opens, type the letters “DLR” as fast as possible in a row while either online or offline with the ECU. A pop-up window will be shown and enter “motor” as the password. The dealer setting will now appear. Only one engine type can be chosen at a time. Enter the desired settings and hit the

Burn button.

Section 1 Crank and Cam Sensor Inputs

Depending on the type of crank and cam sensors that you will be using BigstuffTPM gives you plenty of options to work with. BigstuffTPM currently carries wire harnesses with factory style LS, Modular and Coyote connectors on them to plug into the factory sensors. The universal points style wire harness is for an external ignition box such as and MSD grid. The universal Coil on Plug wire harness will have both an IPU and HED connector on them based on the sensor you will be using. The HED 4-way connectors include a 12vdc, 5vdc, HED Signal and HED Signal ground.

If a factory style LS, Modular, or Coyote BigstuffTPM harness was ordered with the system you will simply plug the Bigstuff3 wire harness connectors into the stock sensors.

The two types of crank signals that the GEN4 ECU can accommodate are either a 2 wire IPU (Inductive Pickup) or 3 wire HED (Hall Effect).

If a ***Crank Sensor 2 Wire IPU*** is going to be used the wires will be connected as the following:

Header 1 A3	**IPU Crank Positive (+)**
Header 1 B3	**IPU Crank Negative (-)**

If a ***Crank Sensor 3 Wire HED*** is going to be used the wires will be connected as the following:

Header 1 J3	**Crank HED Signal**
Header 1 E1	**5vdc Power Supply**
Header 1 J3	**Low Current Ground**

If a ***Cam Sensor 2 Wire IPU*** is going to be used the wires will be connected as the following:

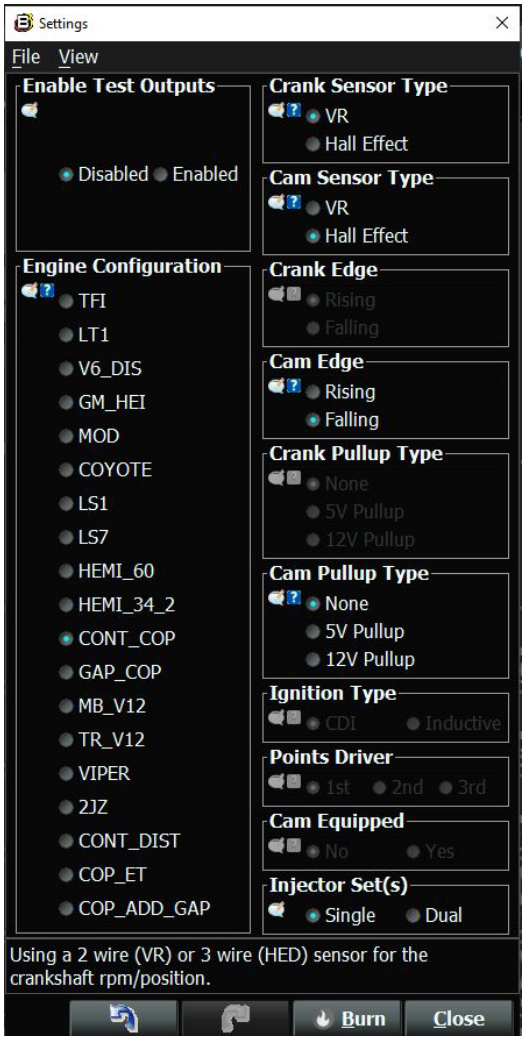
Header 1 C3	**IPU Crank Positive (+)**
Header 1 D3	**IPU Crank Negative (-)**

If a ***Cam Sensor 3 Wire HED*** is going to be used the wires will be connected as the following:

Header 1 E3	**Cam HED Signal**
Header 1 E1	**5vdc Power Supply**
Header 1 J3	**Low Current Ground**

PRO-TIP Most HED crank/cam sensors will allow either 5VDC or 12VDC power. Depending on the manufacturer some crank or cam sensors may also need the 5vdc or 12vdc pull-up power supply enabled in the dealer settings. The pull ups are not to be confused with the actual 5vdc or 12vdc power to the sensor. The pull up power type provides power to the crank or cam signal wire in order to get a proper reading. BigstuffTPM makes it easy as our universal COP wire harnesses come pre-terminated with both a 12vdc or 5vdc power supply for you sensor.

Section 2 Dealer Settings Menu



Most users will choose the following Dealer options:

LS1 - For use with LS1 factory Crank and Cam sensors and a COP configuration.

LS7 - For use with LS7 factory Crank and Cam sensors and a COP configuration.

MOD - For use with Ford Motor factory Crank and Cam Sensors and a COP configuration.

COYOTE - For use with factory Ford Crank and Cam Sensors and a COP Configuration.

CONT_COP - For use with 4X, 12X and 24X Crank Wheels. A Cam sensor must be used in conjunction with the crank or the vehicle will not start.

CONT_DIST - For use with most common style distributors 2-Wire IPU pickups that have 8 reluctors or a 4X crank wheel. A cam sensor is optional using this dealer setting. Individual cylinder fueling is part of the base code and adding a cam sensor will add individual cylinder spark if desired. This will always be used when using the Points Trigger Wire for an external ignition box such as an MSD Grid. ***DO NOT CHOOSE CONT_DIST IF YOU ARE RUNNING A COP CONFIGURATION.***

The Enable Test Outputs and Injector Set(s) options are currently not supported.

Once you have chosen the Engine Configuration type in the Dealer Settings be sure to hit

Burn and restart the vehicles 12v ignition.

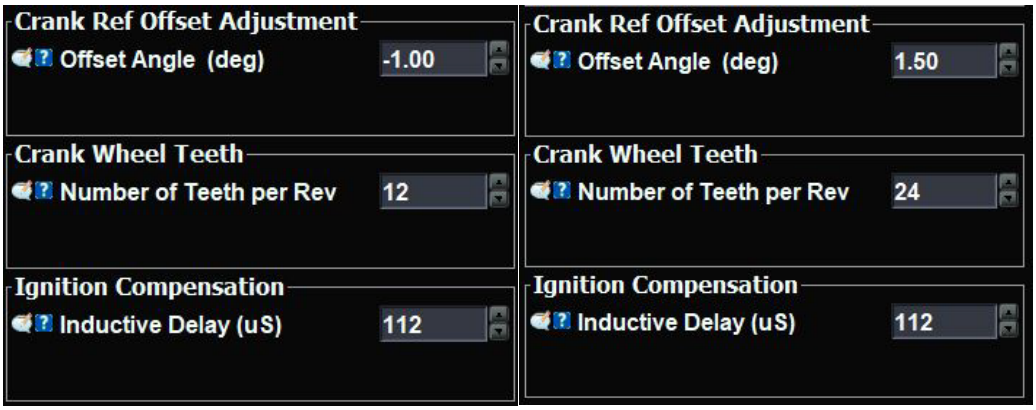
Section 3 Bigcomm Software Settings

In the

System Menu navigate to the Operating Configuration section. In this section we will configure the GEN4 ECU and calibrate the engines timing once running. The Crank Reference Offset Adjustment is what we will use to calibrate the engines timing based on measuring with a timing light in respect to what is being commanded in the GEN4 software.

Note - In order to complete this procedure, you must have your project open, connected to your ECU, a running engine, a good working order timing light, and a timing pointer that references TDC and the harmonic balancer should at least read back to 30*BTDC.

The first step is to make sure the Crank Reference Offset Adjustment setting is the base number being used for you engine calibration. ***All Engine Configurations will use 0 as the base value except for TFI which uses 10 and a 24X Coyote application which uses 45.*** This is the starting point so there is no software timing offset based on what the crank sensor is reading. Ultimately, we would like to keep this number as close as possible to the base value and then adjust the crank sensor up or down to get the engine timing to line up while running. The following pictures below are two examples of a 12X and 24X crank sensor COP configuration. You will note that there are minor adjustments to the Offset Angle in order to get the timing to line up with the engines timing light while the engine is running. Cylinder #1 should always be the cylinder that is used to verify engine timing with the engine running.



The next setting is to enter the amount of Crank Wheel Teeth on the engine. If you are running a COP setup the GEN4 currently supports 4X, 12X and 24X applications. We do not remove any pickups from the trigger wheel for use on the GEN4. If you are in the CONT_DIST setting this will be greyed out as the GEN4 will automatically pickup the number of teeth when cranking to apply the spark output through the Points wire. You would physically move the crank trigger or distributor to get the timing to line up with the engine running.

Next if you are running a Coil/Near Plug Setup the ignition compensation value must be 112uS. Any points style output such as the CONT_DIST setting must be 10uS. These values should never need any adjustment from the base Bigstuff3 values.

Section 4 Test Timing Procedure

The next step is to navigate to the

Ignition Settings menu and choose Spark Modifier Selection. Click on Test Timing Enable and enter a value to calibrate the timing number at for your application. Most users will enter a round number such as 20 or 30 degrees. Once this number is entered hit burn to save the setting.

Now we are assuming that you have a proper startup tune and the engine calibration is configured enough for the engine to run and idle. Follow the steps below to calibrate your engine timing:

1. Start the engine and confirm the Test Timing is enabled in the Ignition Section under Spark Modifiers.
2. Have a timing gun on cylinder #1 and with the engine running, rev the engine to at least 3000rpm while noting the timing reading you are seeing on the harmonic balancer.
3. Now if the running engine timing matches the test timing value you are finished with no further calibration. You will then turn the Test Timing to disabled so that the timing is not a fixed value and will go back to the current calibration settings. If the engine timing does not match proceed to step 4.
4. When the engine was running you will need to make a note of the current reading while running. This current value will be used to adjust the Crank Reference Offset Value in the Operating Configuration Section. The following examples below will show you how to make the proper adjustments.

Example 1

With the engine running you read 25* timing at 3000rpm and the test timing is set to 30*

The following formula will be used to calculate the Crank Reference Offset Adjustment:
Test Timing minus the Actual Timing = Crank Reference Offset Adjustment
Test Timing 30* minus Actual 25* = 5* Crank Reference Offset Adjustment

Go back to the Operating Configuration Section and enter 5 into the Crank Reference Offset Adjustment and hit Burn if online with the ECU. With the engine running and the Test Timing still enabled rev the engine to 3000rpm and your engine timing should now read the same as your Test Timing. Once you are complete Disable the Test Timing and proceed to the High Speed Logger section in this manual if you are running a points based ignition with a cam sensor or a COP setup.

Example 2

With the engine running you read 25* timing at 3000rpm and the test timing is set to 20*

The following formula will be used to calculate the Crank Reference Offset Adjustment:
Test Timing minus the Actual Timing = Crank Reference Offset Adjustment
Test Timing 20* minus Actual 25* = -5* Crank Reference Offset Adjustment

Go back to the Operating Configuration Section and enter a -5 into the Crank Reference Offset Adjustment and hit Burn if online with the ECU. With the engine running and the Test Timing still enabled rev the engine to 3000rpm and your engine timing should now read the same as your Test Timing. Once you are complete Disable the Test Timing and proceed to the High Speed Logger section in this manual if you are running a points based ignition with a cam sensor or a COP setup.

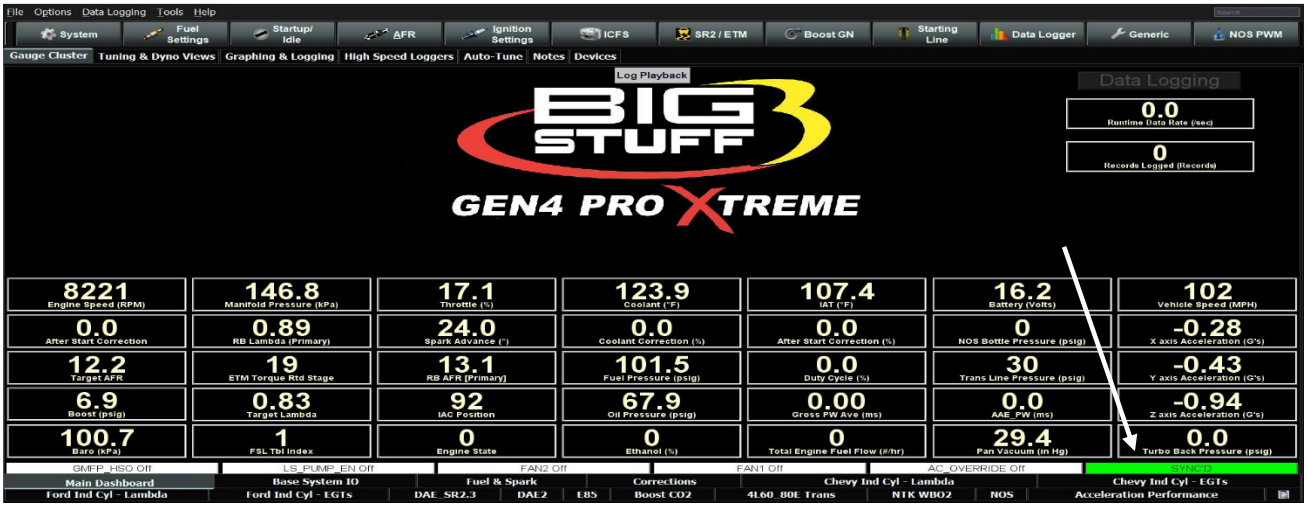
Section 5 High Speed Logger Calibration

The GEN4 High Speed Logger section is where we can validate the crank and cam sensors are reading properly, verify the crank and cam sensor positions in relation to each other, and verify the engine is SYNC'D properly so that the engine will run properly. The High Speed Logger is located in your project under the

AFR menu and its tab is between the Graphing and Logging section and Auto Tune sections.

A few notes before you get started:

1. The High Speed Logger when recording will only show crank/cam sensor data when the engine is running. This includes while cranking the engine.
2. Make the log short as you should only need at most about 5 seconds of recorded data to work with.
3. Be sure to save your data log before or after the recording. This type of log can only open in the High Speed Logger section and not the Graphing and Logging section.
4. The ultimate goal of this section is to insure that you have a SYNC'D green button when the engine is cranking and while running. See the pic below on where you can locate where the SYNC'D value is located on the Gauge Custer tab under the Main Dashboard.



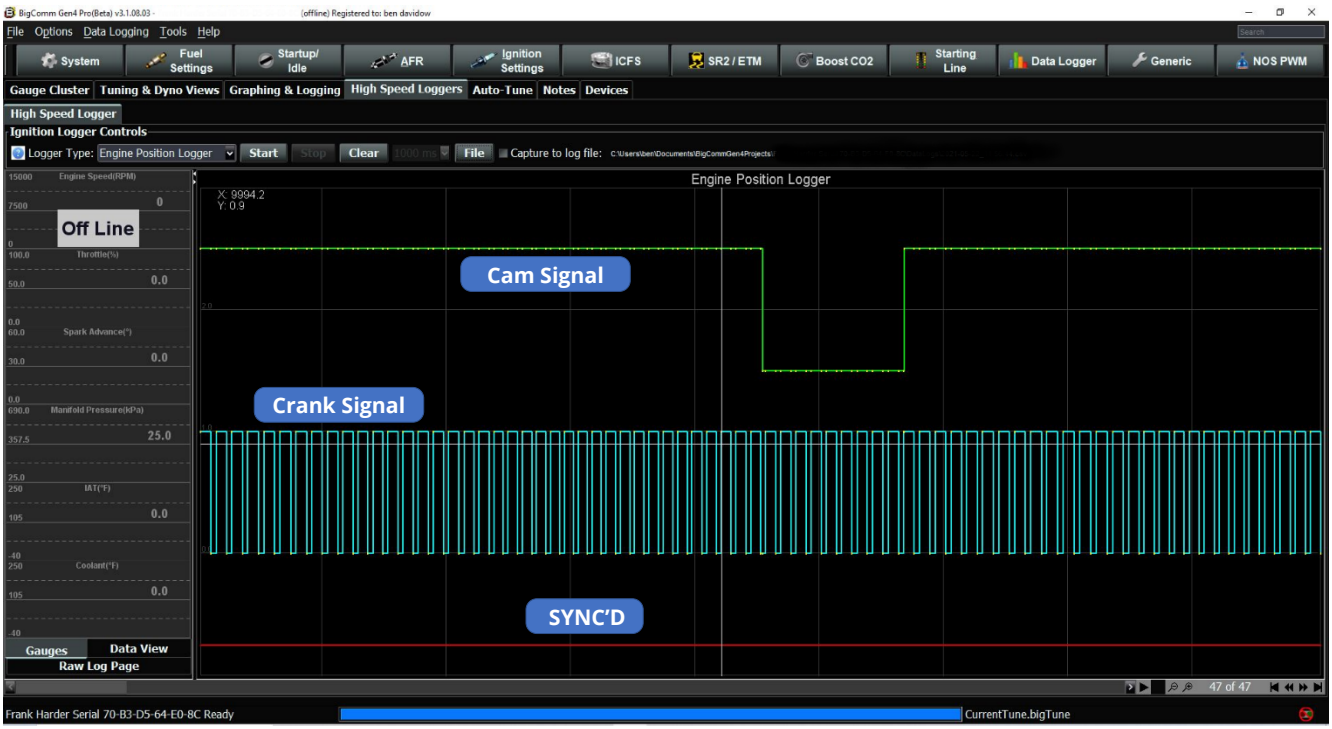
The engine will go SYNC'D while cranking when depending on how the ECU's Crank and Cam inputs are configured and reading properly. If you do not have SYNC'D while cranking or you are loosing SYNC'D while the engine is running you have a crank or cam senor issue that needs to be addressed.

Section 6 Using the High Speed Logger

The High Speed Logger section should only need to be used when first getting the crank and cam signals lined up or correctly or troubleshooting the crank and cam signals if SYNC'D is not present.

Let's first go through how to use the High Speed Logger to verify signals on a new combination. The high speed logger will not apply to factory LS1,LS7,MOD or COYOTE combinations. This is due to the fact the GEN4 already comes configured to read the crank/cam pattern and will not need to be calibrated to confirm the crank/cam sensor locations. It can be used to show if a crank and/or cam sensor is not reading correctly.

When you first open the High Speed Logger the typical engine run data will be on the left under the Gauges tab. To the right under the Engine Position Logger section will be the Crank and Cam sensors being displayed either while cranking or running. The picture below represents a 24X crank trigger wheel and 1X Cam sensor. This is the engine idling and you can see that the signals are showing a very consistent pattern and the red line on the bottom is solid indicating that the engine's crank and cam sensors are SYNC'D properly.



To use the High Speed Logger while Cranking

1. Turn the switched 12vdc ignition on to the engine.
2. On the Main Dashboard section confirm you are seeing your sensors, battery voltage, etc.
3. Navigate to the High Speed Loggers section in the project.

4. Click on the Start button in the High speed logger and then start cranking the engine
5. In about 3-5 seconds you should see the High Speed Logger data on your screen. Left click on the Stop button once the data has been received.
6. Depending on how you have the crank and cam sensors they should now be shown.

To use the High Speed Logger while the engine is running

1. Turn the switched 12vdc ignition on to the engine.
2. On the Main Dashboard section confirm you are seeing your sensors, battery voltage, etc.
3. Navigate to the High Speed Loggers section in the project.
4. With the engine idling hit the Start button and when you see the data on your screen record for about 3-5 seconds left click on the Stop button.
5. Depending on how you have the crank and cam sensors they should now be shown.

Section 7 Using the High Speed Logger to verify the Crank and Cam Positions for a Points style ignition

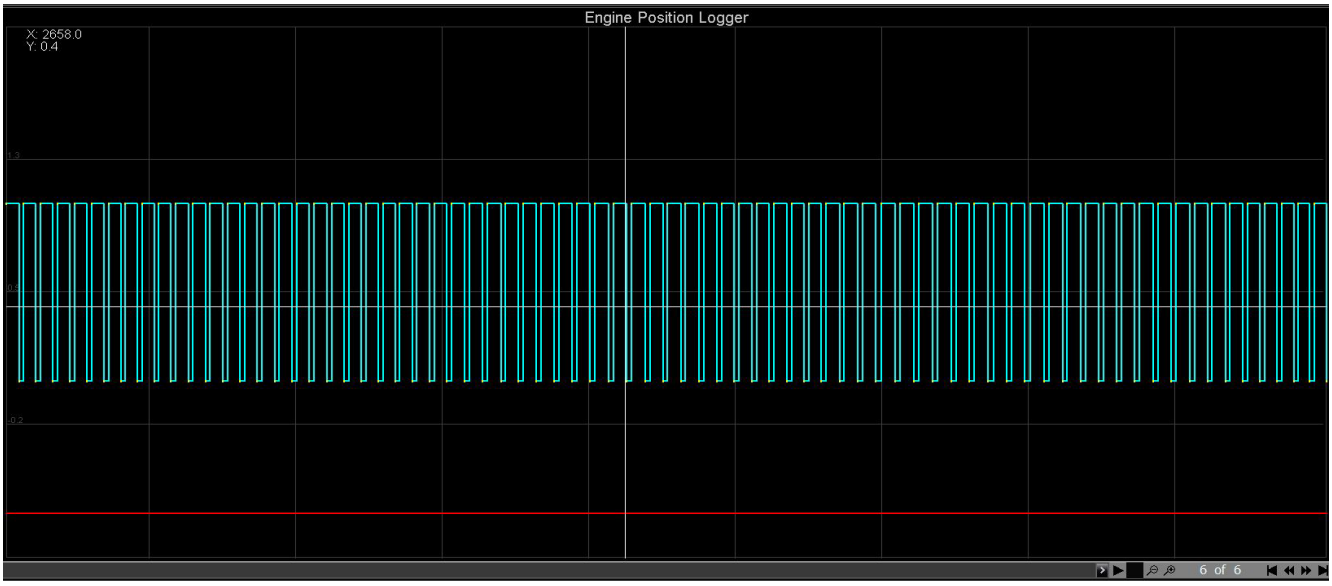
When using a points style ignition a 4 magnet crank trigger or 8 pickup distributor can be used for a crank reference input. An optional cam sensor input can be uses as well to allow for individual cylinder spark control.

First and most important the crank and cam sensors will need to be lined up properly based on the engine combination you are working with.

See the chart below on where to install the crank and cam sensors for an IPU or HE sensor:

Crank Trigger	Crank Trigger Install	Cam Sensor Install
4X	Line up at 45*BTDC / Rising Edge	70*BTDC / Falling Edge
8X Distributor	Line up at TDC #1 / Rising Edge	15*BTDC / Falling Edge

When the engine is running the crank sensor input should be coming in uniform and the red SYNC'D line should be solid. See the picture below for reference and this is without the use of cam sensor.



Now proceed to Step 9 if you are going to use a Cam Sensor with your Points Style Ignition output. If not, your timing calibration is complete and you are ready for use.

Section 8 Using the High Speed Logger to verify the Crank and Cam Positions for COP

The High Speed Logger section will need to be used in order to confirm that the Crank and Cam sensors are working together properly so that the calibration can establish where the number 1 cylinder is located with the engine running. The GEN4 ECU is designed so that it will need a cam sensor input to run properly. If the engine starts and dies immediately after hitting 1000rpm the ECU has determined that it has a crank input but no cam input, so it shuts down. SYNC'D did not go true so it turned the engine off automatically. Once running the ECU will ignore the cam sensor as it is only used on startup.

First and most important the crank and cam sensors will need to be lined up properly based on the engine combination you are working with. ***It is important to have a charged battery and at least 10vdc while cranking the engine with a VR/IPU sensors. This is because unlike a digital signal from a Hall Effect sensor the slower the engine is cranking the lower the voltage output from the sensors.***

See the chart below on where to install the crank and cam sensors for an IPU or HE sensor:

Crank Trigger	Crank Trigger Install	Cam Sensor Install
4X	Line up at TDC #1 / Rising Edge	45*BTDC / Falling Edge
12X	Line up at TDC #1 / Rising Edge	15*BTDC / Falling Edge
24X	Line up to nearest crank pickup / Rising Edge	Falling Edge of TDC #1
24X Coyote	Install at 0* on crank wheel supplied by BS3	See Note 1 below

With a new combination we recommend unplugging the fuel injector harness and check cranking engine timing to confirm you are close to engine timing and that the number 1 cylinder is firing at the right time. If the cranking engine timing is not within 10-50* of the target timing more than likely the engine is firing on the wrong cylinders based on the cam sensor input. Go to

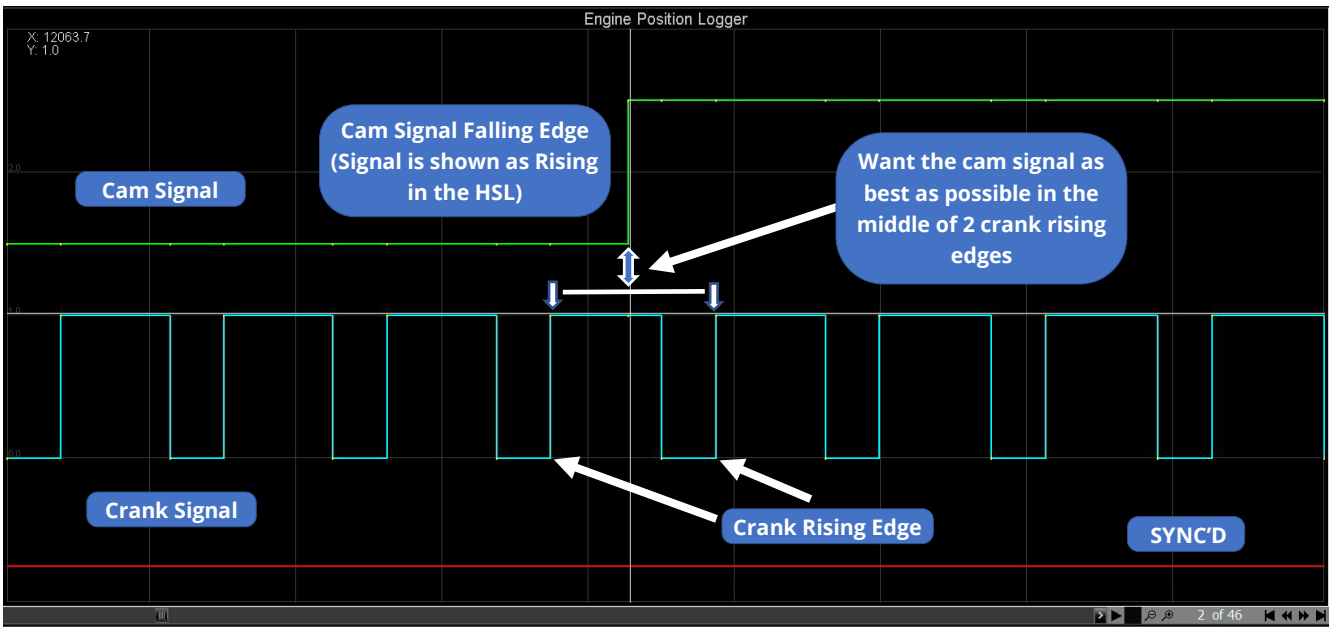
Starup/idle Menu and under Cranking Configuration you can verify the cranking timing.

Section 9 Verifying the Crank to Cam Relationship whether COP or Points

Now we will verify the Crank to Cam sensor relationship in this application. This can be check while running or cranking the engine.

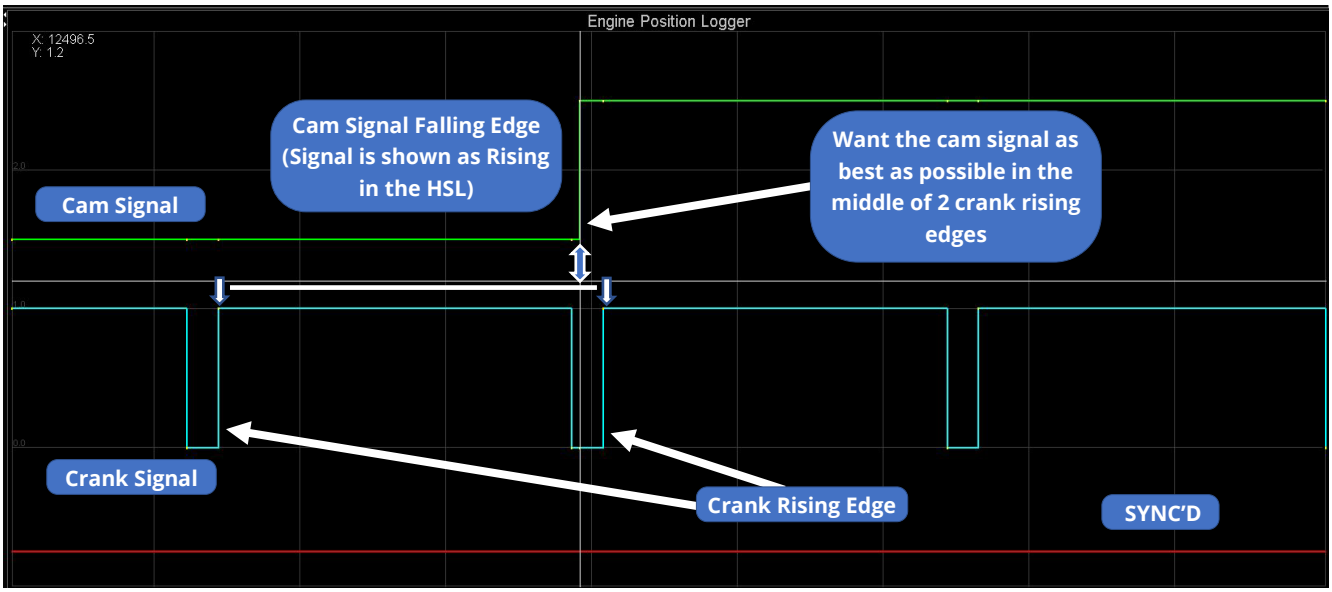
After recording a High Speed Log the data will be shown at its highest viewing resolution possible. In the lower right-hand corner of the High Speed Logger section, left click on the magnifying glass with the plus sign to zoom in on the data.

What we are looking for is the cam sensor falling edge to be between two crank input rising edges. We want the cam sensor to be in the middle as best as possible as to avoid the sensors to be to close to each other during cranking. Remember once the engine is running the cam sensor is not used anymore as the ECU has locked in all the crank and cam positions to keep the ignition timing rock solid.

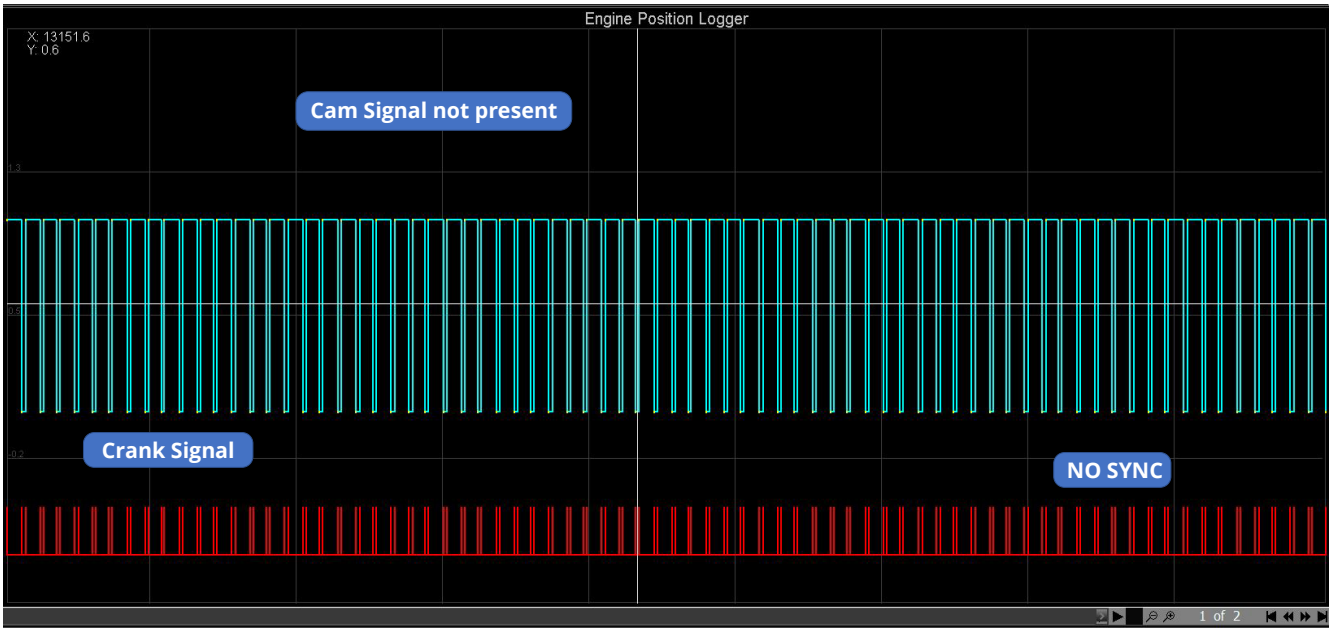


Using the above picture as a guide you should now be reading a very close timing number that is programmed in your cranking timing configuration. You should now be able to start the engine and start dialing in your engine timing. If you need to move the crank trigger to reduce the amount of timing offset from the commanded timing you will need to go back in and double check the High Speed Logger inputs to make sure you are centered as best as possible.

The picture below shows an application on an engine that does run on these crank and cam sensor inputs, but it is not advisable for the cam sensor position in relation to the crank trigger signal.

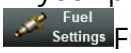


The picture below represents a vehicle that would not start and was configured for a 12X COP application. You can see the crank sensor is present, but the cam sensor is not shown. You will see the red SYNC'D line has whisps that are going up indicating that the ECU cannot go SYNC'D as the crank and cam pattern is not present that the ECU is looking for.



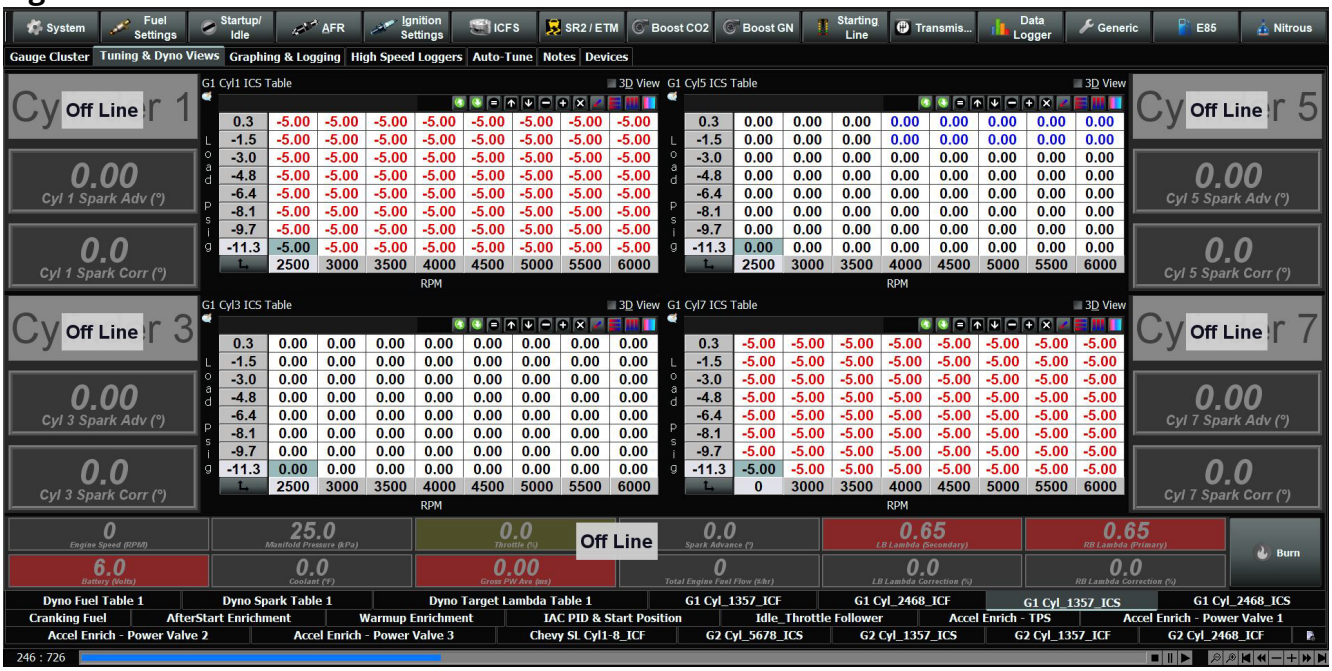
Section 10 Verifying Individual Cylinder Timing is working correctly

Now that we have verified ignition timing and configured the crank to cam relationship, we need to test the individual cylinder timing trim to confirm that we are pulling timing per cylinder correctly. You can check one cylinder for this test, or you can test all of them. Typically, only one cylinder check is necessary as the firing order is being followed and if one checks out then the rest will fall inline as well.

1. In your project navigate to the Tuning and Dyno Views Tab which is located under the 

Fuel Settings section. Once you left click on the tab, look on the bottom for the G1 Cyl_1357_ICS if you are running a Chevrolet combination or G1 Cyl_1234_ICS if you are running a Ford. Depending on how many gears your calibration has there are up to 5 gears of Individual Cylinder Spark tables!
2. Pick one cylinder or as many as you like and input a negative value in all of the cells so that the cylinder at all times will have timing being pulled from the base ignition table table. See Figure 1 below for an example of 5 degrees of timing being pulled from cylinders 1 and 7.
3. Now start the vehicle and in cylinders 1 and 7 they should each be down 5 degrees of timing from the base ignition map. Number 1 should be 5 less showing a number you can work with but number 7 may be anything as its firing at a different time from number 1. However as long as 5 degrees is being pulled from its base number the testing is complete.
4. Be sure to select all the values and return them to zero or enter in your desired calibration data for the individual cylinder trims.

Figure 1



Final Notes

1. The High Speed Logger is only for short logs of 5-10 seconds.
2. High Speed Logs will only be able to be opened in the High Speed Logger section.
3. If you have recorded a log, be sure to save each one.
4. If a log has been recorded and you want to record another one, hit the Clear button to clear the current log to start a new High Speed Log.
5. The High Speed Logger s only for troubleshooting and checking Crank and Cam sensor alignment

Please reach out to Bigstuff3 with any questions at support@bigstufftpm.com or call us at 248-786-7012

We thank you for support of this 100% American made EFI System!

FREQUENTLY ASKED QUESTIONS

• What does working "On line" vs. "Off line" mean?

-Working "Off-line" = The BigStuffTPM ECU is not powered up (PC Only). Working "On-line" = The BigStuffTPM ECU is powered on, the communication is connected between the GEN4 ECU and a PC, and the two are communicating with each other

• Should I use the camshaft position input (cam sync) with my distributor based GEN4 system?

-Without the camshaft position input (cam input connector in the main wire harness) hooked up, the GEN4 system still provides sequential fuel injection and individual fuel control per cylinder, but injector phasing (where the fuel is injected) and individual spark control will not function.

• How can the GEN4 system provide sequential fuel injection and individual fuel control per cylinder without the cam camshaft position input hooked up?
-When the engine starts cranking over, the GEN4 ECU begins firing the injector drivers, assigned to each injector, in the firing order inputted into the software. What the GEN3 system cannot do without the cam camshaft position input hooked up is to determine where to inject fuel (the position in crankshaft degrees, relative to TDC, for each cylinder).

The Base Spark Table('s) are edited as soon in the Bigstuff3 GEN4 ECU Full Software Manual located on our website. Click on this link to navigate and download.

• At what injector duty cycle % are my injectors considered out of control, or static?
-Loss of injector control does not occur at 100% duty cycle, but at approximately 85% duty cycle. At 85% duty cycle the injectors are most likely not opening and closing in a controlled fashion.

-This condition is termed "static" (vs. dynamic) control. An example why this condition is undesirable is if the GEN4 ECU demands more fuel (demanding a larger pulse width) and the injector is already static. The only way to move more fuel through the injector would be to increase the fuel pressure. Increasing the fuel pressure at the 1/8th mile marker is not possible, so things go bad quickly.

-Also, teetering on and off at the static point is also undesirable. Lastly, running the injectors drivers static for long periods of time can damage them.

• How do I set up my ignition system with the GEN4 system?
-For more information on ignition system setups, beyond what is available in this manual, go to the How To/Help section on the BigStuffTPM website, and then Ignition System Setup Tutorial. The link is: http://bigstuffTPM.com/pdf/Ignition%20Guide%20rev%201.2.pdf. There are nine (9) ignition system setups outlined. There is also information on the setting up the Ford TFI, GM HEI, GM Opti-spark & MSD8 ignition systems in the How To/Help section of the website.

• Where can I find wiring harness information on the BS3 power-train system and optional systems?
-Information on most of our wiring harnesses is available on our website at www.bigstufftpm.com.
-Go to the GEN4 section on the website and under the GEN4 PRO XTREME menu will be more information. The link is: http://bigstufftpm.com/gen4/

• My engine will not start. What should I check?
-Make sure the harness side header connectors, interfacing with the GEN4 ECU, are attached and tightened to no more than 15 – 20 inch lbs.
-Make sure the battery voltage is at, or above, 12V during cranking. Low battery voltage conditions must be fixed before trying to start the engine. Battery voltage (especially during cranking) is even more important with coil-on-plug applications.

-Make sure you can see an RPM signal in the software or dash. While turning the engine over, you should see at least 100 – 150 RPM. If no RPM signal is present, check that the crank input (crank trigger or distributor) signal wire is connected to the red wire in the BS3 "Crank" connector. Swap the 2 wires and try again.

-For distributor ignition based applications, make sure the BS3 points wire is connected to the ignition system points input terminal/wire. Applying 12V directly to the BS3 points wire will immediately damage the GEN4 ECU!!
-For COP engines (LSx and other standalone COP engine) the cam input cannot occur at the same time as the crank input!!! If this is the case, the engine will not start. The cam synch pulse must occur before a crank pulse. Ideally, 10* before the crank pulse.
-For more information on ignition system setups, go to the How To/Help section on the BS3 website, then to Ignition System Setup Tutorial.
-With all coil-on-plug engines, make sure the coil ground eyelet is securely fastened to the cylinder head or engine block. No other grounds locations should be used.
-The ECU may be in Clear flood Mode. Make sure the TPS sensor reads near 1-2% when the throttle is closed and near 100% when fully opened. If it reads near 100% when closed, the ECU is in clear flood mode and is not injecting fuel. Swap TPS pins A & C in the TPS connector.
Make sure the crank sensor is connected.
-The LS1 Cam sensor connections are: **• A – Signal • B – Ground • C – 12V •**
The LS2 cam sensor connections must be (terminals A & C are swapped): **• A – 12V • B – Ground • C – Signal**

• My engine timing does seem right, what should I check.
-Make sure the firing order is correct.
-Both the BS3 GEN4 main wiring harness and the MSD ignition system must be connected directly to the battery!! If not, ground loop issues are likely to occur.
-Make sure your pulses per rev in the Operating Configuration table is correct for your application. For example, a four (4) magnet MSD crank trigger setup should have a value of 4.

• I can't get my LSx engine started.
-I'm using an LS2 sensor in the front of the engine.
-Swap pins A & C in the cam input connector around. My TPS sensor reads 100% when the throttle is closed and 0% when the throttle is fully opened. Swap the wires A & C in the TPS connector. The engine may not start since the ECU senses that the Clear flood Mode has been invoked

• If I am tuning in Alpha/N mode (Hardware Configuration, then Control Algorithm) can I use my 1 Bar MAP sensor for barometric compensation?
-Yes, the automatic barometric compensation is hard-coded in the ECU. Leave the MAP sensor vacuum port exposed to the atmosphere. Do not plug the MAP vacuum port to the intake manifold.

• What do I need to do to make sure my 3 step works correctly?

-A clean 12VDC must be applied to Header 2 W1 meaning a relay with only 12vdc. Do not use the same 12VDC feeding the transbrake solenoid as flyback voltage from the transbrake releasing can damage the ECU!
-Confirm the 3 Step settings in the System Menu / RevLimiters are configured correctly. The TPS% On threshold must be higher than the Off threshold.

• I do not think my injectors are pulsing. What can I check?
-Make sure the BS3 and MSD systems are grounded directly to the battery.
-Plug a "noid" light into each injector position in the injector wire harness. Turn the engine over and see if the light pulses for each injector location.

• I do not think my COP coils are firing. What can I check?
-Make sure the BS3 main wire harness ground is wired directly to the battery.
-Make sure the coil ground wire is grounded to the engine block or cylinder head. No other ground location will work!

• Can I use a 5 Bar MAP sensor?
-Yes, choose 5 Bar MAP sensor in the System Menu / Pressure and Sensor Configuration section.
-Be sure to cycle the 12VDC ignition on the ECU and you will need to recalibrate the fuel/afr/spark tables on this or any MAP sensor change.
- Note: The 4 BAR MAP sensor sold by BigStuff3 is good to 52 PSI.

• How do I know if my Bosch LSU4.9 WBO2 sensor is bad?
-First make sure the sensor to main wire harness connection is good.

• How can I check if my NTK WBO2 Methanol sensor is working?
-First check the control circuitry by disconnecting the sensor from the harness. Turn the ignition to the BS3 ECU on. With the engine off its best to move the O2 sensor out of the exhaust and have it hang in the air. Go online with the ECU and navigate to the Gauge Cluster tab and go to the NTKWBO2 tab on the bottom the screen. In the upper right hand corner of the page will be LB%O2 and RB%O2 readings. Go to the AFR Menu and click on the O2 and EGT Parameters section. In the lower right hand corner turn the "Perform NTKO2 WBO2 Air Cal" to "Yes". **WARNING**! Do not hold the O2 sensor as it will start to heat up and you can get severely burned. You will see the O2% readings start to update and after about 5 minutes you should be reading about 18%-22% on either sensor. If you do not read that more than likely the sensor is defective and needs to be replaced. Contact Bigstuff3 for more details at this point. If the sensor reads fine turn the Air Cal to "Off" and turn the ignition off. Wait for the sensor to cool down and reinstall in the exhaust and you are ready to go.

• What caused my O2 sensor to fail?
-Being dropped
-Running leaded fuel
-Running rich at idle

• Does the GEN4 ECU offer an auto-shift feature?
Yes, BigStuff3 offers an optional transmission auto-shift feature. The system will shift up to five (5) speeds with independent shift RPM and Hysteresis points. Once the system is configured for the auto-shift feature, a wire from ECU Header 2 location, P2 must be run to the ground side of the relay.

• What dwell times should be used with the LS1 coils sold with my system?
With a 12V charging system from idle to approximately 4,000 RPM use about 3.0 milliseconds near idle and no more than about 4.0 milliseconds at approximately 4,000 RPM. From approximately 4,100 - Max RPM use no more than about 6 milliseconds of total dwell time at max RPM. With a 16V charging system from idle to approximately 4,000 RPM use about 2.0 milliseconds near idle and no more than about 3.0 milliseconds at approximately 4,000 RPM. From approximately 4,100 - Max RPM use no more than about 4.5 milliseconds of total dwell time at max RPM.

Datalogger acronyms

Point Definitions are displayed in alphabetical order and are the same for either laptop based datalogging or pulling the data from the on board SD card.

A

AC_BUMP_ON – Air Conditioning Engine RPM increase active condition
ACCEL_X – Accelerometer X Axis
ACCEL_Y – Accelerometer Y Axis
ACCEL_Z – Accelerometer Z Axis
ACCEL_ENG – Acceleration Engine value
ACT_IAC_POS – Current Idle Air Control Motor Position
AFR_TARGET – Air Fuel Ratio Target
AFR_L_BANK – Air Fuel Ratio Left Bank
AFR_R_BANK – Air Fuel Ratio Right Bank
AFR_CYL_1 – Air Fuel Ratio Cylinder 1
AFR_CYL_2 – Air Fuel Ratio Cylinder 2
AFR_CYL_3 – Air Fuel Ratio Cylinder 3
AFR_CYL_4 – Air Fuel Ratio Cylinder 4
AFR_CYL_5 – Air Fuel Ratio Cylinder 5
AFR_CYL_6 – Air Fuel Ratio Cylinder 6
AFR_CYL_7 – Air Fuel Ratio Cylinder 7
AFR_CYL_8 – Air Fuel Ratio Cylinder 8

B

BARO – Outside Barometric Pressure
BATTERY_VOLTAGE – Battery voltage
BC_SENSOR_ERROR – Boost Controller Sensor Input Error
BOOST_PSI – Intake Manifold Pressure
BOOST_CL_DC – GN Boost Controller Duty Cycle Output %
Boost_Inc PIDTerm – GN Boost Controller PID Increase %

C

CLT – Coolant Temperature
CORR_AIR – Fuel Percentage Air Temperature Correction
CORR_AFTST – Afterstart Fuel Percentage Correction
CORR_BARO – Barometric Fuel Percentage Correction
CORR_CLT – Coolant Warm Up Temperature Fuel Percentage Correction
CORR_E85 – E85 Fuel Percentage Correction
CORR_ES_PVFC – Extended Source Power Valve Fuel Correction Percentage
CORR_FP_COMP – Fuel Pressure Correction
CORR_PVF – Power Valve Fuel Correction
CORR_SLT – Start Line Fuel Percentage Correction

D

DAE_INPUT – DAE 12vdc Input true or false
DSRD_BOOST_MAP – Desired Boost Map
DSRD_SR2_MAP – Desired SR2 Map
DUTY_CYCLE_BOOST_INC – Boost Controller Duty Cycle Output Increase %
DUTY_CYCLE_BOOST_DEC – Boost Controller Duty Cycle Output Decrease %
DUTY_CYCLE_PWM07 – Duty Cycle Output Pulse Width Modulation 07
DUTY_CYCLE_PWM08 – Duty Cycle Output Pulse Width Modulation 08
DUTY_CYCLE_PWM09 – Duty Cycle Output Pulse Width Modulation 09
DUTY_CYCLE_NOS_PRG – Progressive Nitrous Duty Cycle Control Output Percentage
DUTY_CYCLE_CYL1 – Fuel Injector Duty Cycle Percentage Cylinder 1
DUTY_CYCLE_CYL2 – Fuel Injector Duty Cycle Percentage Cylinder 2
DUTY_CYCLE_CYL3 – Fuel Injector Duty Cycle Percentage Cylinder 3
DUTY_CYCLE_CYL4 – Fuel Injector Duty Cycle Percentage Cylinder 4
DUTY_CYCLE_CYL5 – Fuel Injector Duty Cycle Percentage Cylinder 5
DUTY_CYCLE_CYL6 – Fuel Injector Duty Cycle Percentage Cylinder 6
DUTY_CYCLE_CYL7 – Fuel Injector Duty Cycle Percentage Cylinder 7
DUTY_CYCLE_CYL8 – Fuel Injector Duty Cycle Percentage Cylinder 8
DUTY_CYCLE_FRCMTR – Duty Cycle Force Motor Output Percentage (Used with 4L60E/80E)

DUTY_CYCLE_TCC – Duty Cycle Torque Converter Clutch Output (Used with 4L60E/80E)
DWELL_TIME – Ignition Coil Dwell Time

E

E85_SPARK_OFFSET – E85 Spark Offset
ECM_RB_EC – NTK O2 Sensor Right Bank Error Code
ECU_SYNC – Current ECU Synchronization Status
EGT_CYL1 – Exhaust Gas Temperature Cylinder 1
EGT_CYL2 – Exhaust Gas Temperature Cylinder 2
EGT_CYL3 – Exhaust Gas Temperature Cylinder 3
EGT_CYL4 – Exhaust Gas Temperature Cylinder 4
EGT_CYL5 – Exhaust Gas Temperature Cylinder 5
EGT_CYL6 – Exhaust Gas Temperature Cylinder 6
EGT_CYL7 – Exhaust Gas Temperature Cylinder 7
EGT_CYL8 – Exhaust Gas Temperature Cylinder 8
ENG_STATE – Engine State (1-Engine Cranking, 4-Engine Running Steady, 5-Engine Accelerating, 6-Engine Decelerating, 7-Deceleration Fuel Cutoff)
EGT_SHUTDOWN_ACTIVE – Exhaust Gas Temperature Shutdown Active Condition
ETM_TORQ_STG – Engine Torque Management Torque Stage Current Value
ETM_DS_ENG_ERROR – ETM Driveshaft or Engine RPM Error
ETM_DS_ENG_DSRD – ETM Driveshaft or Engine RPM Desired

F

FP_SENSOR_ERROR – Fuel Pressure Sensor Input Error
FP_WARNING_ACTIVE – Fuel Pressure Warning Active Condition
FSL_TBL_INDEX – Fuel Spark Lambda current map enabled
FUEL_FLOW_CYL1 – Calculated Fuel flow in lbs/hr for Cylinder 1
FUEL_FLOW_CYL2 – Calculated Fuel flow in lbs/hr for Cylinder 2
FUEL_FLOW_CYL3 – Calculated Fuel flow in lbs/hr for Cylinder 3
FUEL_FLOW_CYL4 – Calculated Fuel flow in lbs/hr for Cylinder 4
FUEL_FLOW_CYL5 – Calculated Fuel flow in lbs/hr for Cylinder 5
FUEL_FLOW_CYL6 – Calculated Fuel flow in lbs/hr for Cylinder 6
FUEL_FLOW_CYL7 – Calculated Fuel flow in lbs/hr for Cylinder 7
FUEL_FLOW_CYL8 – Calculated Fuel flow in lbs/hr for Cylinder 8
FUEL_FLOW_TOTAL – Total Calculated Fuel Flow of cylinders 1-8 in lbs/hr

G

GEAR – Current Gear position calculated by engine rpm drop
GEN_BOOST_ADD – Generic Boost Tables Additional Boost Pressure
GEN_FUEL_LBSHR_ADD – Generic Fuel Lbs/hr adder

GEN_FUEL_MULT – Generic Fuel Multiplier Percentage Adder
GEN_LAMBDA_ADD – Generic Lambda Fuel Adder
GEN_LAMBDA_MULT – Generic Lambda Fuel Multiplier
GEN_SPK_ADV_ADD – Generic Spark Advance Adder
GS_ACCEL – Gear Speed Acceleration
GYRO_X – Gyrometer X Axis
GYRO_Y – Gyrometer Y Axis
GYRO_Z – Gyrometer Z Axis

H

HEAD_TEMP_RB – Head Temperature Right Bank. When in Pro Mod Mode located in the System->Hardware Configuration section this sensor is enabled for use. Pro Mod Mode sets the water and air sensors to 100* in the software so that they have no bearing on the overall VE fuel calculation. This is the GM Water Temperature Sensor.
HEAD_TEMP_LB – Head Temperature Left Bank. When in Pro Mod Mode located in the System->Hardware Configuration section this sensor is enabled for use. Pro Mod Mode sets the water and air sensors to 100* in the software so that they have no bearing on the overall VE fuel calculation. This is the GM Air Temperature Sensor.

I

IAT – Intake Air Temperature
ICF_CORR_CYL1 – Individual Cylinder Fuel Percentage Correction Cylinder 1
ICF_CORR_CYL2 – Individual Cylinder Fuel Percentage Correction Cylinder 2
ICF_CORR_CYL3 – Individual Cylinder Fuel Percentage Correction Cylinder 3
ICF_CORR_CYL4 – Individual Cylinder Fuel Percentage Correction Cylinder 4
ICF_CORR_CYL5 – Individual Cylinder Fuel Percentage Correction Cylinder 5
ICF_CORR_CYL6 – Individual Cylinder Fuel Percentage Correction Cylinder 6
ICF_CORR_CYL7 – Individual Cylinder Fuel Percentage Correction Cylinder 7
ICF_CORR_CYL8 – Individual Cylinder Fuel Percentage Correction Cylinder 8
ICS_CORR_CYL1 – Individual Cylinder Spark Correction Cylinder 1
ICS_CORR_CYL2 – Individual Cylinder Spark Correction Cylinder 2
ICS_CORR_CYL3 – Individual Cylinder Spark Correction Cylinder 3
ICS_CORR_CYL4 – Individual Cylinder Spark Correction Cylinder 4
ICS_CORR_CYL5 – Individual Cylinder Spark Correction Cylinder 5
ICS_CORR_CYL6 – Individual Cylinder Spark Correction Cylinder 6
ICS_CORR_CYL7 – Individual Cylinder Spark Correction Cylinder 7
ICS_CORR_CYL8 – Individual Cylinder Spark Correction Cylinder 8
INJ_GPW_AVE – Fuel Injector Gross Pulse Width Average
INJ_PHASE_ANGLE – Fuel Injector Injection Event Phase Angle
IOT – Fuel Injector Opening Tim

L

LAMBDA_CYL1 – Lambda Value Cylinder 1
LAMBDA_CYL2 – Lambda Value Cylinder 2
LAMBDA_CYL3 – Lambda Value Cylinder 3
LAMBDA_CYL4 – Lambda Value Cylinder 4
LAMBDA_CYL5 – Lambda Value Cylinder 5
LAMBDA_CYL6 – Lambda Value Cylinder 6
LAMBDA_CYL7 – Lambda Value Cylinder 7
LAMBDA_CYL8 – Lambda Value Cylinder 8
LAMBDA_L_BANK – Lambda Reading Left Bank
LAMBDA_R_BANK – Lambda Reading Right Bank
LAMBDA_TARGET – Lambda Reading Left Bank
LAMBDA_RB_UA – Lambda Right Bank NTK O2 Error Code
LASER_HEIGHT__AD5 – Laser Height Sensor Reading

M

MAP – Engine Intake Manifold Pressure
MPH – Miles Per Hour

N

NERNST_CYL1 – Resistance value of the Cylinder 1 Bosch O2 sensor. Normal value is around 300. **NERNST_CYL2** – Resistance value of the Cylinder 2 Bosch O2 sensor. Normal value is around 300.
NERNST_CYL3 – Resistance value of the Cylinder 3 Bosch O2 sensor. Normal value is around 300.
NERNST_CYL4 – Resistance value of the Cylinder 4 Bosch O2 sensor. Normal value is around 300.
NERNST_CYL5 – Resistance value of the Cylinder 5 Bosch O2 sensor. Normal value is around 300.
NERNST_CYL6 – Resistance value of the Cylinder 6 Bosch O2 sensor. Normal value is around 300.
NERNST_CYL7 – Resistance value of the Cylinder 7 Bosch O2 sensor. Normal value is around 300.
NERNST_CYL8 – Resistance value of the Cylinder 8 Bosch O2 sensor. Normal value is around 300.
NOS_STAGE – Current NOS Stage
NOS_BOOST_ENABLE – Nitrous or Boost Enable Arm Switch
NOS_TIMER – When activated is the Nitrous Run Time
NOS_ICS_CORR_CYL1 – Nitrous Individual Cylinder Spark Correction Cylinder 1
NOS_ICS_CORR_CYL2 – Nitrous Individual Cylinder Spark Correction Cylinder 2

NOS_ICS_CORR_CYL3 – Nitrous Individual Cylinder Spark Correction Cylinder 3
NOS_ICS_CORR_CYL4 – Nitrous Individual Cylinder Spark Correction Cylinder 4
NOS_ICS_CORR_CYL5 – Nitrous Individual Cylinder Spark Correction Cylinder 5
NOS_ICS_CORR_CYL6 – Nitrous Individual Cylinder Spark Correction Cylinder 6
NOS_ICS_CORR_CYL7 – Nitrous Individual Cylinder Spark Correction Cylinder 7
NOS_ICS_CORR_CYL8 – Nitrous Individual Cylinder Spark Correction Cylinder 8

O

O2_CORR_CYL1 – Closed Loop O2 AFR Fuel Correction Cylinder 1
O2_CORR_CYL2 – Closed Loop O2 AFR Fuel Correction Cylinder 2
O2_CORR_CYL3 – Closed Loop O2 AFR Fuel Correction Cylinder 3
O2_CORR_CYL4 – Closed Loop O2 AFR Fuel Correction Cylinder 4
O2_CORR_CYL5 – Closed Loop O2 AFR Fuel Correction Cylinder 5
O2_CORR_CYL6 – Closed Loop O2 AFR Fuel Correction Cylinder 6
O2_CORR_CYL7 – Closed Loop O2 AFR Fuel Correction Cylinder 7
O2_CORR_CYL8 – Closed Loop O2 AFR Fuel Correction Cylinder 8
O2_CORR_L_BANK – Closed Loop O2 AFR Fuel Correction Left Bank
O2_CORR_R_BANK – Closed Loop O2 AFR Fuel Correction Right Bank

P

PCT_ETHANOL – Percentage of Ethanol in fuel (Need sensor to read properly)
PEDAL_BIT_MODE – Pedal Bit Mode Current Condition
PCT_TCC_SLIP – Percentage of Torque Converter Clutch Slippage (Used with 4L60E/80E)
PRESS_FUEL – Fuel Pressure Reading
PRESS_OIL – Oil Pressure Reading
PRESS_TURBO – Turbocharger Pressure Reading
PRESS_WG – Wastegate Pressure Reading
PRESS_NOS – Nitrous Pressure Reading
PRESS_PV – Pan Vacuum Reading
PRESS_TL – Transmission Line Pressure Reading
PRESS_DSRD_WG – CO2 Desired Wastegate
PRNDL – Park / Reverse / Neutral / Drive / Low (Used with 4L60E/80E)

R

RACE_FUEL_LBS_HR – NOS Mode Race Fuel Lbs/hr fuel adder
REV_LIMITER – Current condition of any active rev limiters
RPM_ENGINE – Engine RPM
RPM_TSS1_LB – Turbocharger Shaft Speed RPM Left Bank
RPM_TSS2_RB – Turbocharger Shaft Speed RPM Right Bank
RPM_ABS_FW – RPM Front Wheel Speed Sensor

RPM_ABS_RW – RPM Rear Wheel Speed Sensor
RPM_TOSS – RPM Transmission Output Speed Sensor or Driveshaft Sensor
RPM_TISS – RPM Transmission Input Speed Sensor

S

SLT_MODE – Start Line Timing Mode Current Condition
SHOCK_RF__AD7 – Right Front Shock Reading
SHOCK_LF__AD8 – Left Front Shock Reading
SHOCK_RR__AD9 – Right Rear Shock Reading
SHOCK_LR__AD10 – Left Rear Shock Reading
SPK_ADV_BCP – Base Spark Advance
SPK_ADV_CYL1 – Spark Advance Cylinder 1
SPK_ADV_CYL2 – Spark Advance Cylinder 2
SPK_ADV_CYL3 – Spark Advance Cylinder 3
SPK_ADV_CYL4 – Spark Advance Cylinder 4
SPK_ADV_CYL5 – Spark Advance Cylinder 5
SPK_ADV_CYL6 – Spark Advance Cylinder 6
SPK_ADV_CYL7 – Spark Advance Cylinder 7
SPK_ADV_CYL8 – Spark Advance Cylinder 8
SR2_TIMER – Current Race time after the release of the three step
SR2_GEAR1_SPK_OFFSET – SR2 Gear 1 Spark Offset
SR2_DS_SPK_OFFSET – SR2 Driveshaft or Engine Spark Offset
SR2_DS_ERROR – SR2 Driveshaft or Engine RPM Error
SR2_DS_DSRD – SR2 Driveshaft or Engine RPM Desired
SS_SPK_NOS_RTD – Street Strip Nitrous Spark Retard
SS_NOS_FUEL_ADD – Street Strip Nitrous Fuel Adder
SS_NOS_LAMBDA_OFFSET – Street Strip Nitrous Lambda Target Offset

T

TPS – Throttle Position Sensor Percentage
TOT – Transmission Oil Temperature Reading
THREE_STEP_INPUT – Three Step Input 12vdc true or false
THREE_STEP_MODE – Three Step Active Condition
TRANS_GEAR_RATIO – Current Transmission Gear Ratio (Used with 4L60E/80E)
TSD_GEAR1_OFFSET – Touch Screen Dash Gear 1 Offset
TSD_SR2_DS_OFFSET – Touchscreen Dash SR2 Driveshaft or Engine RPM Offset
TSD_ETM_DS_OFFSET – Touchscreen Dash ETM Driveshaft or Engine RPM Offset
TWO_STEP_INPUT – Two Step Input 12vdc true or false
TWO_STEP_ACTIVE – Two Step Active Condition
TWO_STEP_MODE – Two Step Active Condition

V

VE -Volumetric Efficiency number calculated from the base fuel map

W

WHEEL SPIN – Calculated wheel speed based off differential from either the rear wheel speed sensor or driveshaft sensor compared to the front wheel speed sensor.

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