GEN4 PRO XTREME BigComm Pro Startup/Idle Menu User Manual

www.**BigStuff3EFI**.com

HOW TO USE THE BIGCOMM PRO CONFIGURATION & CALIBRATION TOOL BAR STARTUP/IDLE MENU AND SUBMENUS

The **Startup / Idle** menu is used to configure the GEN4 PRO XTREME ECU functionality for all things startup and Idle related to your project.

All of the submenus located inside this section will be used to fine tune the startup and idle characteristics of your engine combination.
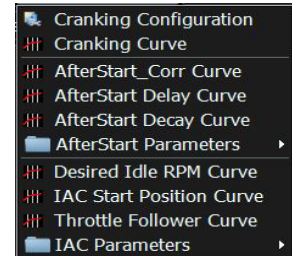
• *THROTTLE POSITION SENSOR CALIBRATION*

The very first thing to do is calibrate the TPS sensor on the engine before starting to configure these tables. It is recommended to calibrate the TPS sensor anytime the idle screw is adjusted to get the engine running at a baseline engine RPM. The calibration of the TPS sensor helps to configure the ECU so it knows the min and max readings of the TPS sensor on your engine. With the TPS calibrated the engine will know when it's at an idle state and the transition fuel percentages will work properly.

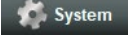**Follow the steps below to calibrate the TPS sensor on the GEN4 ECU:**

1. Open your current project and locate the TPS% on the user dashboard. Open and close the throttle to confirm the TPS sensor is reading values between 0-100%. Do not worry if the values are higher or lower as we will get the values configured next. If your TPS sensor is not showing a change as you open and close the throttle you will need to troubleshoot the wiring for something unplugged, a short or a bad sensor. Once you have a reading proceed to Step 2.

2. If the engine has previously been ran and you are happy with where the engine is currently idling proceed to Step 4. If the engine RPM idle is currently to low or high proceed to Step 3.

3. With the engine running adjust the idle screw until the engine is very close to your target RPM while the engine is at operating temperature. Typical hot idle targets are from 750-1000rpm. Do not do this while the engine is cold as you will have a higher RPM idle target which will go down as the engine begins to warm up.

4. Make sure the engine is turned off, the engine is warmed up and you are connected with your laptop to the ECU. Take note of where the TPS% is in your project currently. You should be somewhere between 2%-20%. Now that we have a baseline, we are going to calibrate the TPS sensor.

TPS Calibration Procedure
1. Turn the ignition off on your ECU if you had it switched on
2. Turn the ignition on to your ECU and go online with your current project
3. Find the current TPS% reading

4. With the engine **NOT** running press the throttle to 100% for 3 seconds

5. After 3 seconds release the throttle for 1 second

6. Press the throttle to 100% again for 3 seconds

7. Release the throttle and verify your TPS% sensor reading is now showing 0% from whatever your baseline reading was currently showing

That's it! Your TPS sensor is now calibrated and ready for use. If the sensor value did not change from you baseline, try the calibration procedure again.
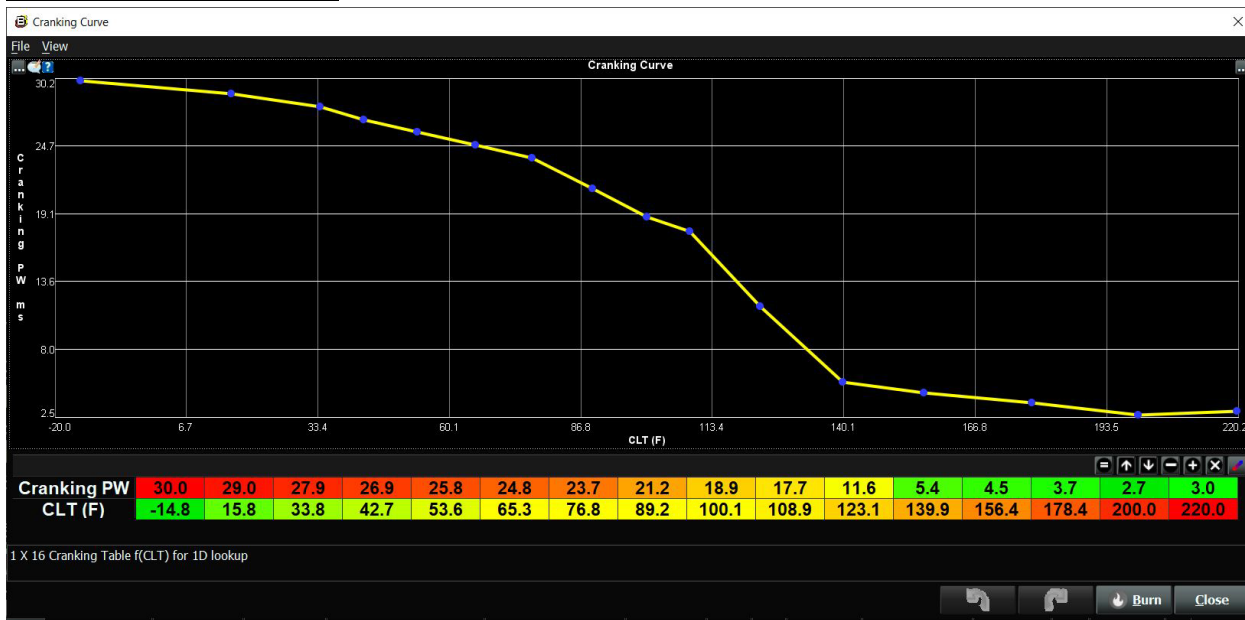
Now that the TPS% is calibrated make sure in the System [System] Menu you go to the operating configuration section and set your Max TPS for Idle (%) to a value that you would like to use. Most values are in the 1% to 5% range.

• *CRANKING CONFIGURATION*
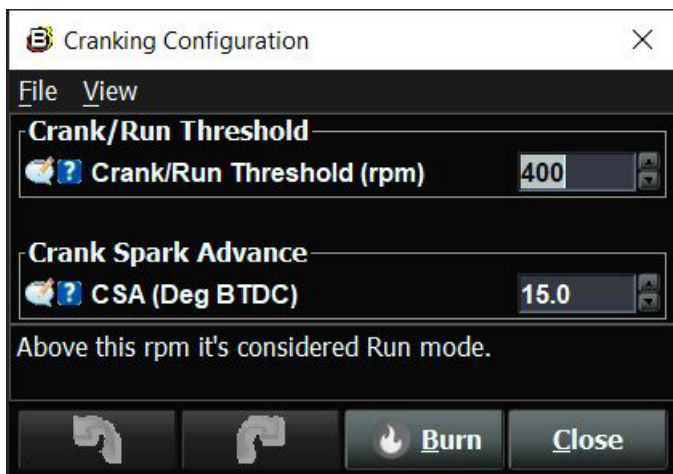
1. The Crank/Run Threshold is the minimum RPM necessary where your engine transitions from a cranking mode to a run mode. Any RPM above this setting will be considered for your engine to be running.

2. The Crank Spark Advance is timing number that your ECU uses while cranking the engine

• CRANKING CURVE

Cranking PW	30.0	29.0	27.9	26.9	25.8	24.8	23.7	21.2	18.9	17.7	11.6	5.4	4.5	3.7	2.7	3.0
CLT (F)	-14.8	15.8	33.8	42.7	53.6	65.3	76.8	89.2	100.1	108.9	123.1	139.9	156.4	178.4	200.0	220.0

1 X 16 Cranking Table f(CLT) for 1D lookup

The Cranking Curve is a raw injector pulse width that the ECU uses to provide fuel while the engine is in the cranking mode. The base fuel tables or other fuel modifiers will have no bearing on the fuel delivered while cranking, only this table.

Typically, you will have much more cranking fuel being used when the engine is cold rather than hot. This is due to the fuel being suspended more in air the colder the engine is as its cranking. Some engines when warmed up can have under 1mS of fuel being delivered while cranking. The goal is to start the engine without having to use the throttle if possible.

This is achieved with a combination of this table, a properly tuned based fuel table, warmup coolant enrichment table, and proper IAC motor configuration.

• AFTERSTART PARAMETERS
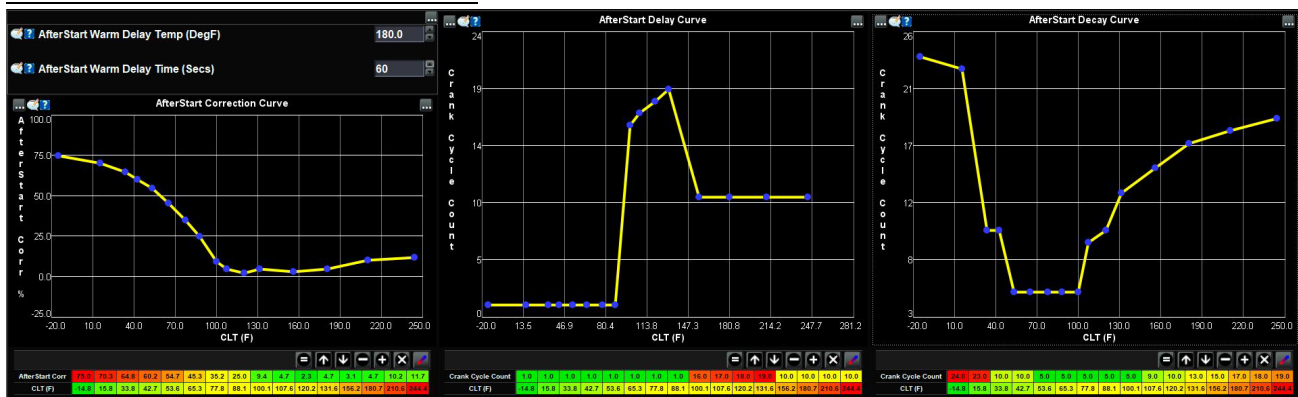
1. The After Start Warm Delay Temp is the coolant temperature used to enable the After Start timer.
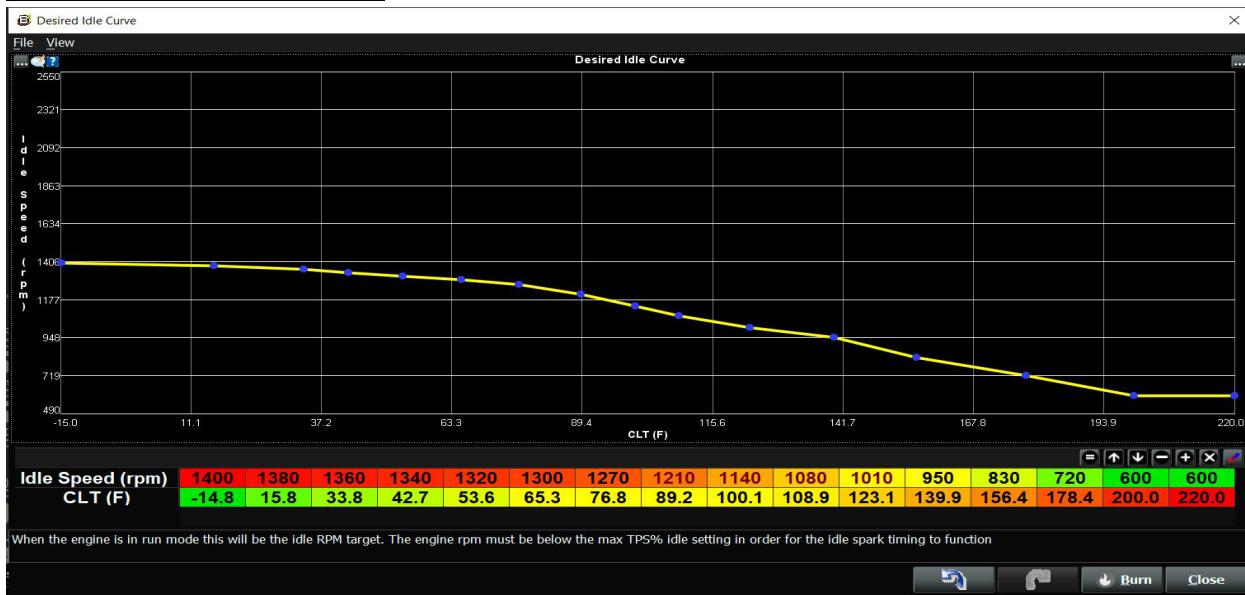
2. The After Start Warm Delay time is the delay time the ECU used to delay turning off. We recommend for a racecar application to set this value to 1 second so that the ECU will shut down quicker. This will make for faster programming changes due to faster reset times of the ECU after programming. This delay time is used no matter what the After Start Warm Delay Temp value is programmed.

3. The Afterstart Correction curve allows the user to define the amount of After Start Correction fuel to be added as a function of coolant temperature. The After Start Correction fuel is added synchronously as a percent (%) of the base pulse width (defined in the Fuel table). As you will notice in the table, the percent (%) of fuel added is greater at the two temperature extremes. The largest amount of fuel is needed when the engine is coldest. A larger amount of fuel is also added when the engine is hot versus the mid range temperatures, to release any vaporized fuel that may have "boiled" in the fuel rail(s) during a hot soak.

4. Once the ECU detects the engine has started, it uses the vehicle coolant temperature sensor and inputs from the After Start Delay table to decide when to introduce the After Start Correction Fuel. The ECU begins counting the crankshaft interrupts. When the ECU counts off the number of interrupts defined in the After Start Delay table, for the current engine operating temperature, the ECU adds the After Start Correction Fuel. The delay mentioned here is very, very short. The table below shows that nine (1) interrupts were used at –14* and 10 interrupts at 244* . One can appreciate how quickly nine (1) or sixteen (10) crankshaft interrupts occur at an engine speed of 800 RPM.

5. The After Start Correction fuel, being added by the ECU during an engine starting routine, is only required for a very short period of time. The ECU pulls the fuel back out, or decays it, as a function of crankshaft interrupts and coolant temperature. The ECU decays the After Start Correction Fuel over the number of interrupts, depending on the temperature the engine is currently operating at, defined in the After Start Decay table. The decay period mentioned here is very, very short. The table below shows 24 interrupts were used at –14* and 19 interrupts at 244*
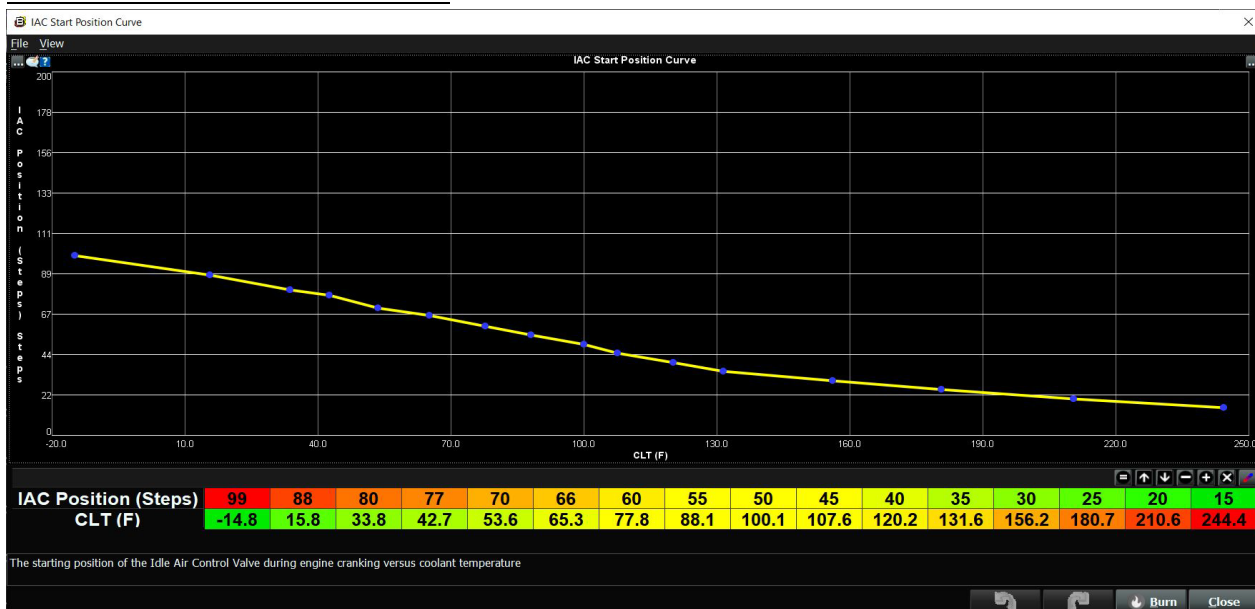
• DESIRED IDLE CURVE

Idle Speed (rpm)	1400	1380	1360	1340	1320	1300	1270	1210	1140	1080	1010	950	830	720	600	600
CLT (F)	-14.8	15.8	33.8	42.7	53.6	65.3	76.8	89.2	100.1	108.9	123.1	139.9	156.4	178.4	200.0	220.0

When the engine is in run mode this will be the idle RPM target. The engine rpm must be below the max TPS% idle setting in order for the idle spark timing to function

The Idle Speed Curve table is enabled anytime the engine is considered to be at an idle state. The ECU considers idle to be below the Max TPS for Idle (%) setting in the System Menu under the Operating Configuration section. Most engines will have a higher engine idle target setting when they are colder to achieve warmup faster.

The idle speed curve will be controlled using the engines IAC motor and idle spark if that is enabled on the ECU.

• IAC Start Position Curve

IAC Position (Steps)	99	88	80	77	70	66	60	55	50	45	40	35	30	25	20	15
CLT (F)	-14.8	15.8	33.8	42.7	53.6	65.3	77.8	88.1	100.1	107.6	120.2	131.6	156.2	180.7	210.6	244.4

The starting position of the Idle Air Control Valve during engine cranking versus coolant temperature
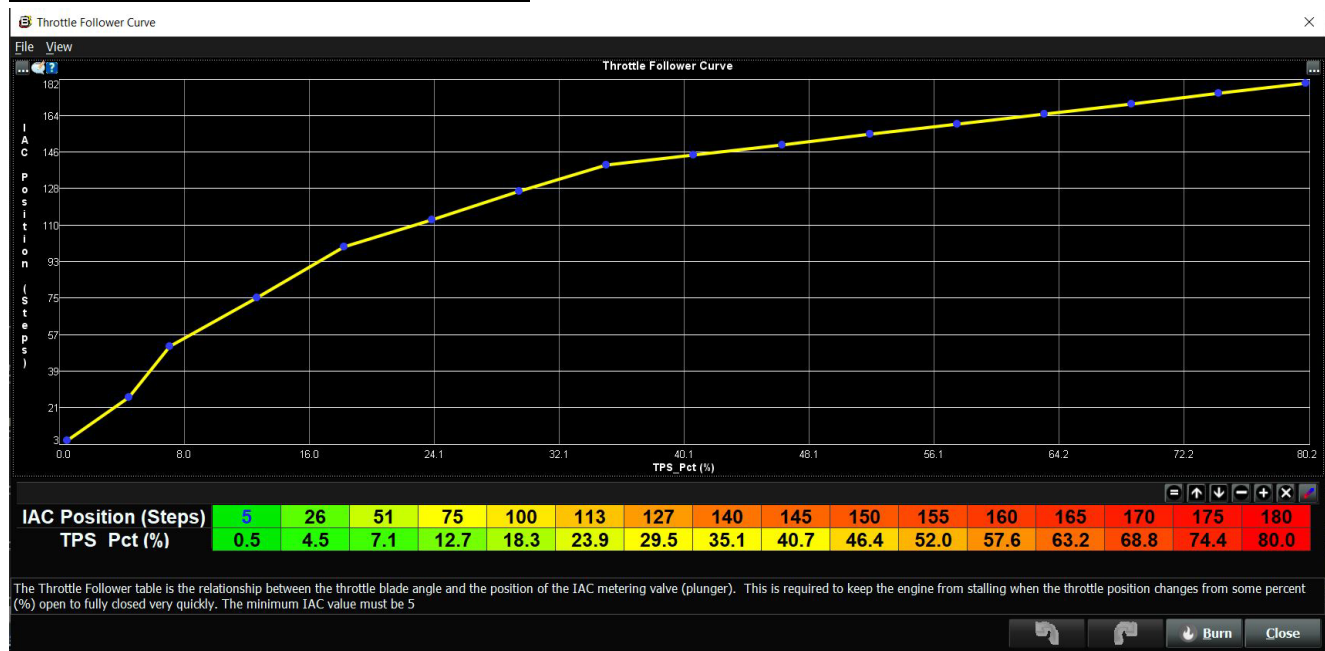
The Idle Airspeed Control start position curve is used to adjust where the IAC motor is going to open to while the engine is cranking depending on the coolant temperature. Most engines will require increased airflow into the engine thus a higher IAC opening will be required. The IAC motor will work between 0-255 steps allowing you plenty of adjustment to allow airflow into the engine.

With the engine warmed up if you go to start the engine and the engine RPM flares up over your target idle 200-500 RPM you should bring the IAC position steps down until the engine flare stops when starting. The opposite is true if the engine needs throttle to start and keep running and it may need more IAC steps to start properly. This is assuming the throttle is calibrated and the engine cranking fuel is close as well.

Once the engine while warmed up is starting without a big flare you can create a curve so that when cold it will not flare as well. This may take a couple of tries as you only get a true cold start once a day.

• *THROTTLE FOLLOWER CURVE*

IAC Position (Steps)	5	26	51	75	100	113	127	140	145	150	155	160	165	170	175	180
TPS Pct (%)	0.5	4.5	7.1	12.7	18.3	23.9	29.5	35.1	40.7	46.4	52.0	57.6	63.2	68.8	74.4	80.0

The Throttle Follower table is the relationship between the throttle blade angle and the position of the IAC metering valve (plunger). This is required to keep the engine from stalling when the throttle position changes from some percent (%) open to fully closed very quickly. The minimum IAC value must be 5

Throttle bodies used with electronic fuel injection systems have an air by-pass channel molded or machined into the valve body to allow air to be bypassed around the throttle blades when they are fully closed. The air entering the engine through the bypass channel is used to control the engine idle speed. The amount of air needed to maintain a desired engine speed varies depending on engine coolant temperature, camshaft overlap, etc.

The Idle Airspeed Control (IAC) motor (and plunger) control the amount of air allowed to be bypassed around the throttle blades. The "Throttle Follower" table allows the user to set a relationship between throttle blade angle and the position of the IAC metering valve (plunger). This is required to keep the engine from stalling when the throttle position changes from some percent (%) open to fully closed very quickly

Use this table to adjust the IAC motor in relation to where the throttle blades are during normai operation. It's best to have a minum of 5 steps at your lowest TPS% setting but sometimes it needs to be lowered based on the engine combination. The values in this table will work in

conjunction with the idle PID settings to maintain a consistent engine idle RPM no matter what operating state the motor is running in.

• IAC PID CONTROL GAINS

The IAC stepper motor is controlled by PID terms that are preprogrammed into the ECU. The baseline values below should get the engine close if using an IAC motor.

The proportional setting is considered to be the coarse adjustment.

The Integral setting is considered to be the medium adjustment.

The Derivative setting is to be considered the fine adjustment.
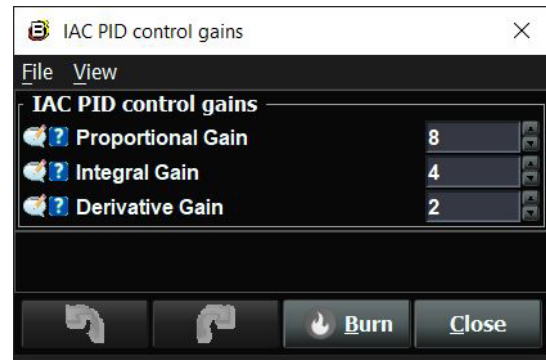
The numbers when adjusted up will allow the PID speed to increase operating the IAC motor faster. The numbers when adjusted lower will lower how quickly the IAC motor is allowed to move. Typically, If when you stap the throttle at idle and the engine RPM hangs longer than normal you will increment the proportional values up first with a max of 32. Once you get the engine RPM close to where you want it fine tune with the Integral and Derivative settings.

FREQUENTLY ASKED QUESTIONS

• **What does working "On line" vs. "Off line" mean?**
-Working "Off-line" = The BigStuff3 ECU is not powered up (PC Only). Working "On-line" = The BigStuff3 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).

• **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 BigStuff3 website, and then Ignition System Setup Tutorial. The link is: http://bigstuff3.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.bigstuff3.com.
-Go to the GEN4 section on the website and under the GEN4 PRO XTREME menu will be more information. The link is: http://bigstuff3.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.