ECM Tuning Notes for Buell DDFI and DDFI-2
2nd Edition

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1 Disclaimer

This guide is intended to assist in the tuning of your Buell ECM.

If you modify your ECM, you may be legally obliged to notify your insurance company. It may also be illegal in some countries to ride on the road with a modified ECM.

It should also be stated that modifying your ECM can void your manufacturer's warranty.

All numbers shown in lists, tables and maps are examples and are not included for use in your ECM.

Before you start your tuning adventure, backup the ECM content, save this file and back it up to a safe location, CD or another machine. This file is essential if anything goes wrong and you need to recover your ECM.

Never change more than one thing, or one area at a time! Always know what you have done.

Do not adjust areas of the ECM if you do not know what they do.

MODIFYING YOUR ECM WILL INVALIDATE WARRANTY, COULD DAMAGE YOUR ENGINE AND IS PERFORMED ***ENTIRELY AT YOUR OWN RISK*****!** IN THE U.S.A., CANADA AND EUROPE, FEDERAL LAW MAKES IT ILLEGAL FOR ANYONE TO TAMPER WITH, DISCONNECT, REMOVE OR OTHERWISE RENDER INOPERATIVE *ANY* AUTOMOTIVE EMISSIONS RELATED CONTROL DEVICE. IN GENERAL, THE ENTIRE FUEL SYSTEM AND ALL ITS INDIVIDUAL COMPONENTS (INCLUDING THE EFI ECM) ARE CONSIDERED 'EMISSIONS RELATED CONTROL DEVICES'. THE PENALTIES FOR TAMPERING CAN BE SUBSTANTIAL.

Bear this in mind when using this guide

2 Introduction

This guide has been produced to give the budding tuner some background and methods when using tools, such as ECMSpy, to make changes to the Buell ECM.

Issue 2 of this document describes salient parts of the operation of the DDFI-2 ECM and presents case studies where the described methods have been used to success.

Issue 3 of this document will concentrate on DDFI-3 and is hoped will also cover DDFI.

The authors acknowledge that the document is by no means complete and welcome feedback, reporting of errors, comments and suggestions for further inclusions to tuningguide@ecmspy.com.

3 ECMs and Fuel Injection

Electronic fuel injection (EFI) is a way of metering fuel to run internal combustion engines. The process is controlled by a electronic device, called the ECU (Engine Control Unit), EEC (Engine Electronic Controller) or ECM (Engine Control Module).

The ECM and its associated hardware forms the Buell EFI system and takes the place of the carburettor and ignition system on your Buell. The ECM also controls the fan and exhaust valve (on XB12 models) and has it's own built in test system for itself and associated hardware, flagging up error codes when problems are detected.

The ECM holds the key to getting your bike to run well, within the constraints of the exhaust, inlet and engine hardware.

This document focuses on changes to key fuelling and ignition control parameters and is the result of more than three years development in Europe, America and Australia, predominantly on DDFI-2 systems.

4 Buell ECM History

DDFI

For the FI tubers, these are ECM types with an "A" as the second letter, i.e. KA210 and JA120

DDFI-2

For early XBs, with a "B" as the second letter, i.e. CB060 GB231 IB310 or - Japan only - a "C" as the second letter. This ECM has an additional spade connector for either the active muffler control or pressure compensation.

DDFI-3

For later XBs and 1125s with "D" as the second letter. The first letter usually changes with the EEPROM layout, this is also shown in the EEPROM data, e.g. 89 for YDxxx and 90 for ZDxxx. The three trailing numbers and letters show the release, i.e. M31EC27 for XB or B3HUS10 for 1125. This is also stored in EEPROM for the later ECMs.

5 ECM operation

To get the best out of the ECM, it is important to understand how it works. This section explains the operation.

Throughout this section, EEPROM parameters are referred to in square brackets, i.e. [Parameter Name]. These can be cross referenced in section 18.

5.1 Fuel control

The basic function of the ECM is to meter fuel in response to air flow. Figure 1 and Figure 2 show the schematics of operation for the front and rear cylinder fuel control during steady state conditions.

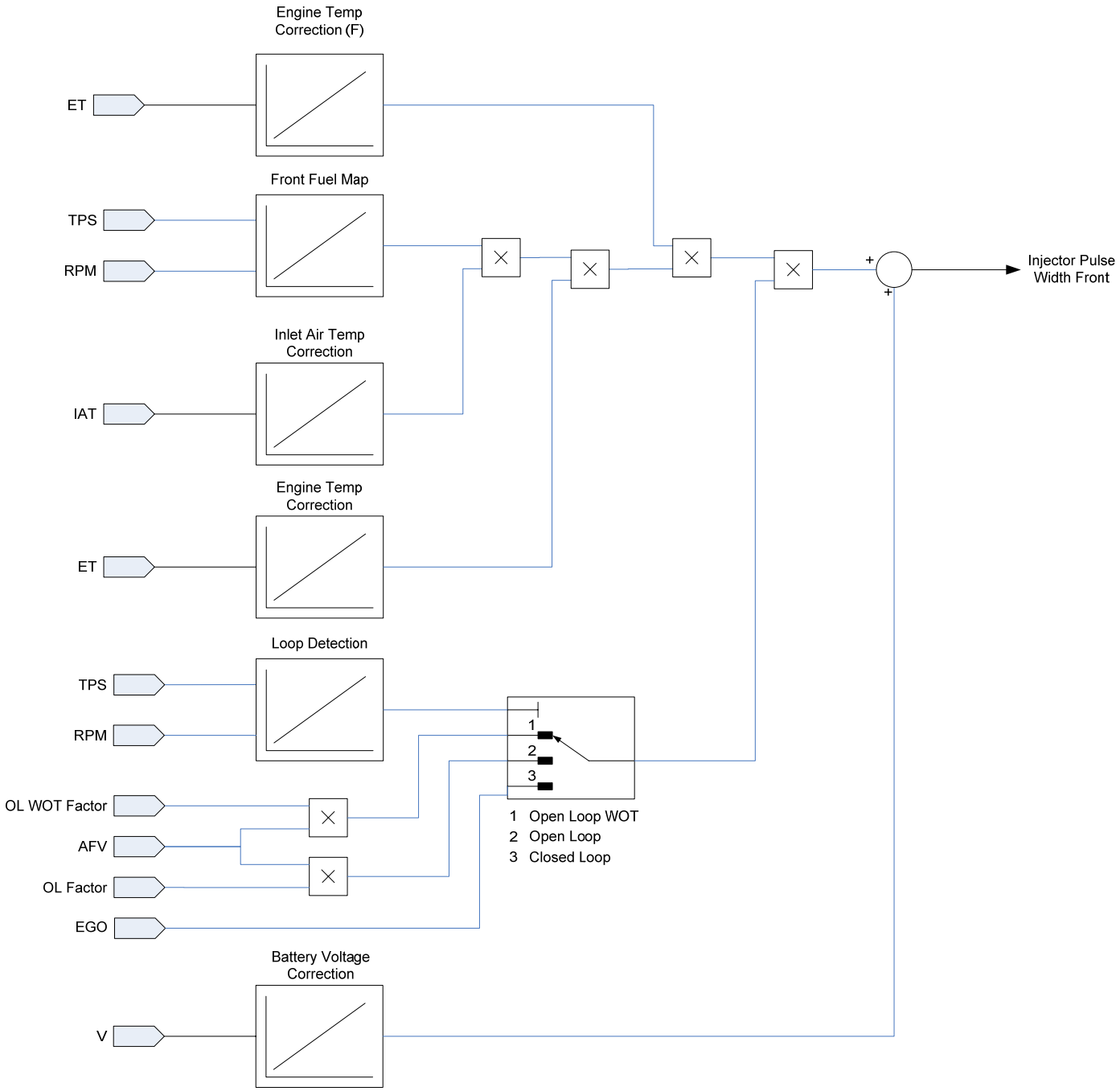


Figure 1 Front cylinder fuel metering

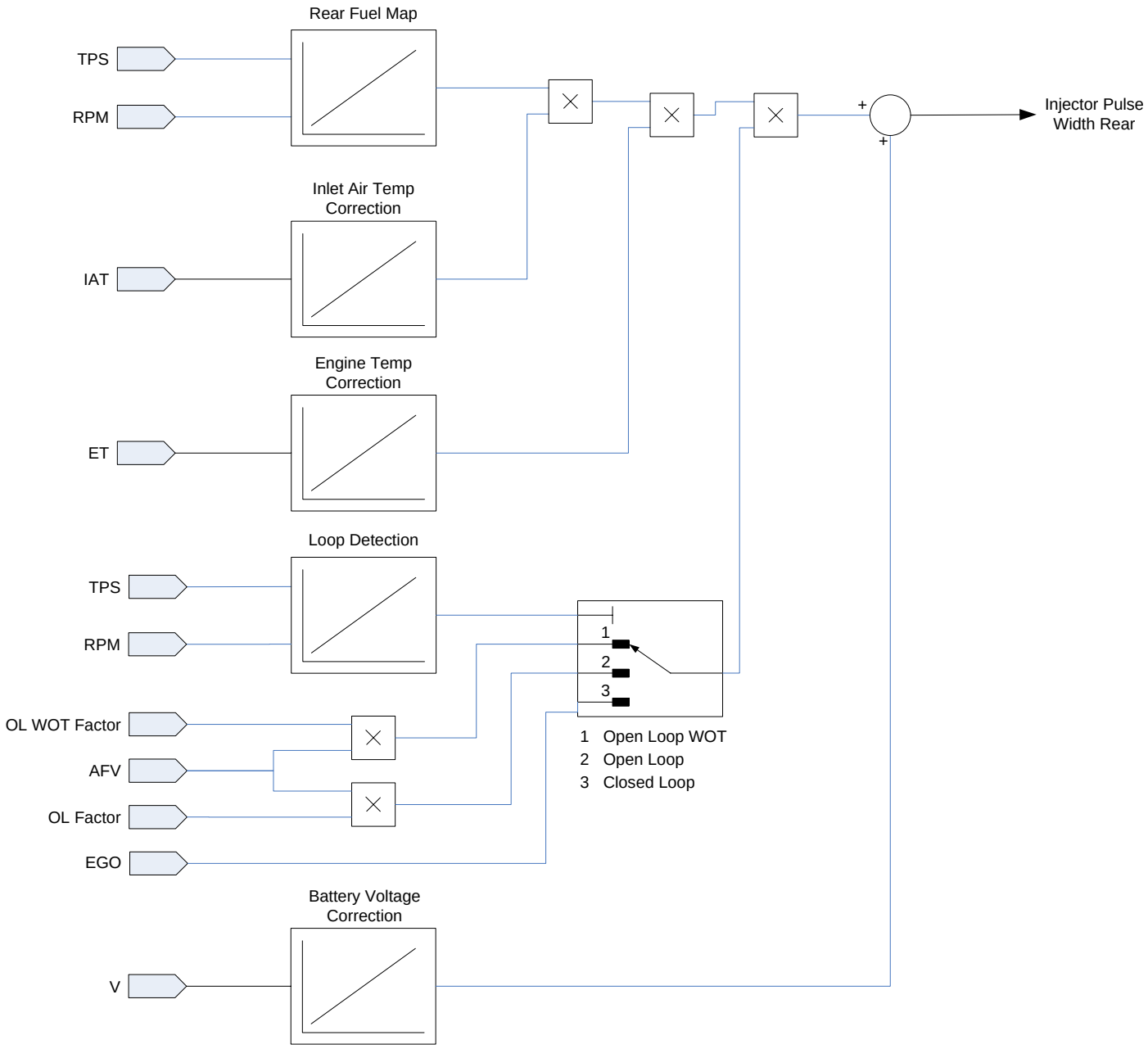


Figure 2 Rear cylinder fuel metering

These diagrams can be broken down into:

The fuel maps

The applied corrections

The control loops

In addition to the steady state operation above, fuel is metered to support acceleration enrichment when accelerating. This is discussed later in the section.

5.1.1 Fuel Maps

The starting point for the ECM when deciding how much fuel to deliver to the engine is the base fuel map. The Buell ECMs use separate maps for front and rear cylinders, shown in Figure 1 and Figure 2 as Front Fuel Map and Rear Fuel Map.

The fuel map is read as a function of throttle position and engine speed. This type of fuel control is known as Alpha-N, where Alpha refers to throttle angle and N refers to engine speed.

Each point in the fuel map does not describe a fuel flow, but an injector pulse width, i.e. how long the injector is opened and flowing fuel. If the fuel pressure is increased, or the injector size is increased, then for the same pulse width, the fuel flow will increase. For the technically minded, each value in the table equates to 58 microseconds of injector pulse width duration (DDFI and DDFI-2 only).

The alpha, or throttle angle, is measured by the TPS, the *throttle position sensor*. If the TPS value is incorrect, the ECM will provide the amount of fuel required for the wrong throttle setting and hence poor running will occur. A worse scenario is if you tune the bike with an incorrect TPS value, then any future correction to the TPS will result in incorrect fuel maps. It is therefore very important to reset the TPS prior to tuning.

The fuel map shows the TPS values on the left (range 0 - 255) and the engine speed across the top. Low throttle, low engine speed is on the bottom left, with full throttle, high engine speed on top right. (Values shown in the table below are just given as an example and not suitable to be used for any Buell.)

TPS / RPM	0	800	1000	1350	1900	2400	2900	3400	4000	5000	6000	7000	8000
255	145	145	145	170	190	155	149	158	189	194	189	171	172
175	145	145	145	145	170	180	155	140	144	167	162	167	144
125	135	135	135	135	170	180	150	130	144	135	135	122	108
100	135	135	135	131	165	180	145	122	129	122	114	108	104
80	135	135	135	127	160	170	125	120	135	120	118	100	100
60	130	130	130	129	143	145	108	104	107	96	88	75	70
50	125	125	125	126	125	135	101	89	87	79	67	62	60
40	116	116	116	120	115	107	81	73	68	64	54	54	55
30	100	100	104	110	97	72	65	51	51	40	40	35	35
20	95	88	86	82	66	50	41	32	31	30	29	30	30
15	82	74	66	55	37	34	25	26	24	23	23	22	22
10	70	56	53	42	36	33	24	23	23	22	22	20	20

5.1.1.1 Front and Rear Maps

The Buell and most air cooled in-line V twins run on different temperatures for the rear and front cylinder due to airflow across the fins. The ECM has separate tables for fuel and ignition on front and rear cylinders with a temperature dependent front cylinder fuel correction. Due to an uneven firing order and intake and exhaust design, the volumetric efficiency and hence fuel requirement for the front and rear cylinder are not the same. It has been noted that changing fuel on one cylinder can also change mixture for the other one, keep this in mind and double check for any side effects.

5.1.1.2 Areas of the Fuel Map

The fuel map can be broken down into different areas which have different requirements on fuelling. Figure 3 is intended to help explain the areas of the fuel map and what the rider needs from those areas. It is only an indication, but should help you understand how the map works.

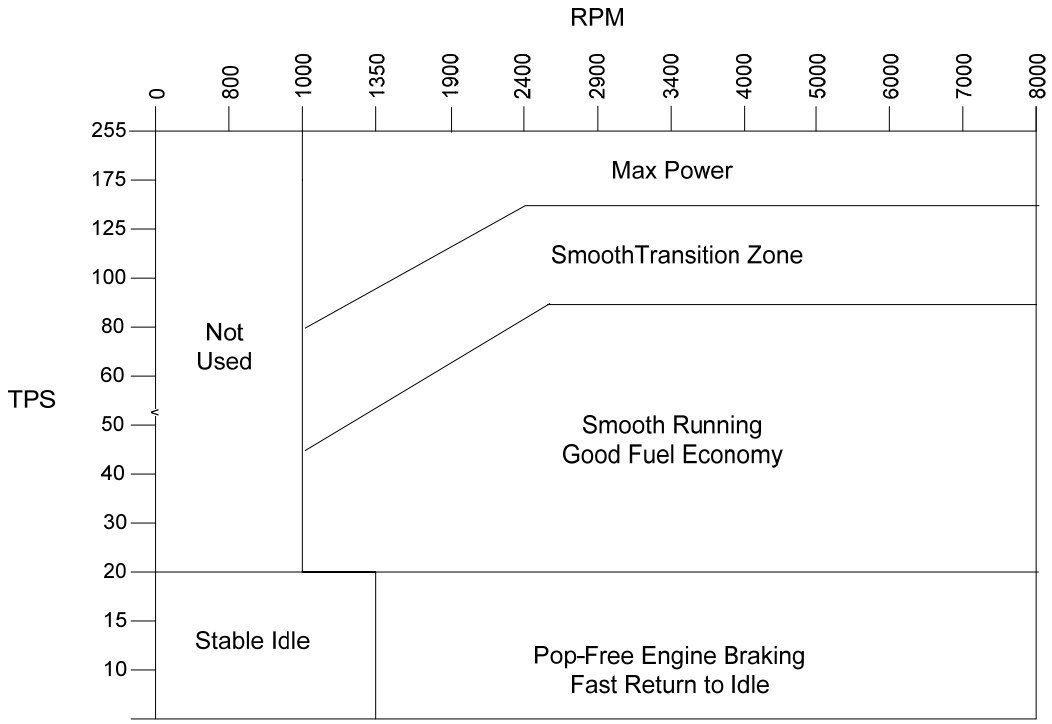


Figure 3 Map usage domains – Requirements for engine operation

Note, the XB12 redlines at 6800RPM, the XB9 at 7300RPM, hence the final column will hardly be used on a Buell.

Depending on what the bike is used for, different areas of the map will be visited. The following diagram gives an example of the use of the map for road and track riding.

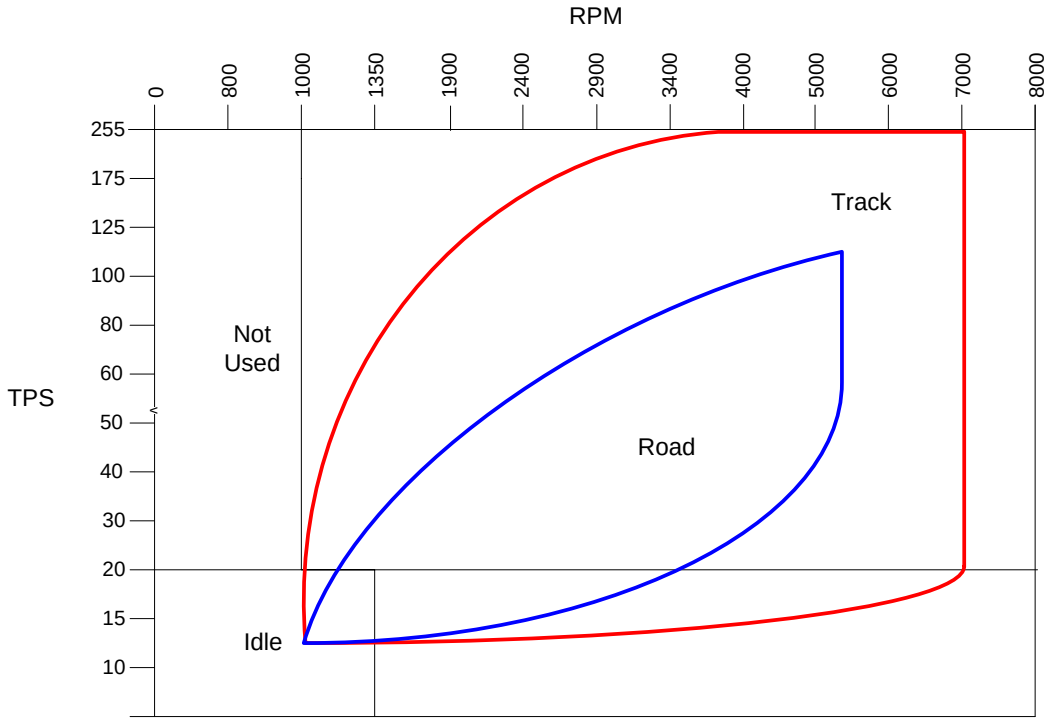


Figure 4 Map usage domains – Road and track operation

For the track, the throttle is generally wide open for max power, however it is shut for maximum engine braking and feathered open to control the power when exiting corners. For road riding, the diagonals are closer together as the use of the throttle is less fierce. It is these diagonals which form the basis of a closed loop area.

The base fuel map is the map where the remapping will be performed

5.1.2 Applied Corrections

Corrections are applied to the base fuel maps to account for changes in atmospheric conditions, engine operating conditions and unit to unit variations, such as engine deterioration and sensor calibration errors. The ECM holds several correction tables to adjust fuel to various changing conditions. Many of these tables rely on engine temperature, like the warm up enrichment or the front cylinder correction.

These corrections are applied constantly during engine running.

The following corrections generally do not need adjustment to suit your bike, unless you live in a unique environment, e.g. up the mountains, in which case, you are probably lucky enough to have wonderful roads with Buell written all over them.

5.1.2.1 Inlet Air Temperature Correction

The inlet air temperature correction compensates for changes in air density due to air temperature changes. Cold air is denser than hot air and as a result more fuel can be burned. As the air temperature reduces, the ECM compensates by increasing the fuel flow.

From simple physics the density as a function of temperature can be calculated. A correction can then be calculated to account for the change in density, about a temperature origin.

With the Buell ECM, the origin temperature is set at 25 deg C.

Figure 5 shows the calculated correction and Table 1 shows a sample table applied to the base fuel map.

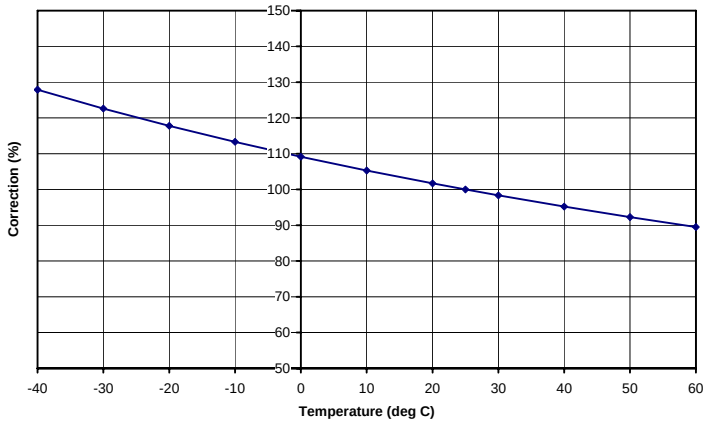


Figure 5 Correction for Inlet Air Temperature calculated from physics (Ideal Gas Law)

Table 1 Inlet Air Temperature correction values

Air Temp. (°C)	Fuel (%)
-40	125
0	110
25	100
50	90
75	82
100	74
125	68

It is unlikely that this correction will need any attention

5.1.2.2 Engine Temperature Correction

This is more normally referred to on older vehicles as the choke. The ECM uses the rear cylinder temperature and provides additional fuel to a cold engine to compensate for reduced fuel vaporisation performance.

Note that at high temperatures, excess fuel is added for cooling and sensor failure purposes

Table 2 shows a sample table applied to the base fuel map.

Table 2 Engine Temperature correction values example

Eng.Temp. (°C)	Fuel (%)
-10	160
20	125
65	110
130	105
190	100
235	100
260	110

A separate engine temperature correction is applied to idle and is shown in Table 3.

As the engine on an XB typically operates between 180 and 220, the correction applied is 100%.

It is unlikely that this correction will need any attention

Table 3 Engine Temperature correction values (Idle) example

Eng.Temp. (°C)	Fuel (%)
0	110
65	105
160	100
215	100

As the engine on an XB typically operates between 180 and 220, the correction applied is 100%.

It is unlikely that this correction will need any attention

5.1.2.3 Engine Temperature Correction (Front Cylinder)

The ECM allows the correction of the front cylinder fuel table to compensate for cooling differences between the front and rear cylinders.

Table 4 shows a sample table applied to the base fuel map.

Table 4 Engine Temperature Correction (Front Cylinder) values example

Eng.Temp. (°C)	Fuel (%)
20	115
60	105
170	100
240	100

As the engine on an XB typically operates between 180 and 220, the correction applied is 100%.

It is unlikely that this correction will need any attention

5.1.2.4 Battery Voltage Correction

The time taken to open the fuel injector increases as the supply voltage decreases. A correction for battery voltage is applied to compensate for this, however the correction is added (a delta) to the base fuel map rather then multiplied (a factor) as the corrections discussed above.

Table 5 shows a sample table applied to the base fuel map.

Table 5 Battery Voltage Correction values

Battery Voltage (V)	Correction
0	160
6	125
10	90
12	60
14	25
16	0

It is unlikely that this correction will need any attention

5.1.2.5 Exhaust Oxygen Measurement Corrections

The EGO and AFV are corrections which are derived from the measurement of oxygen in the exhaust, using the O2 or Lambda sensor. The corrections are derived and applied to compensate for other uncertainties, such as changes in air pressure, engine to engine variations, air filter clogging, exhaust deterioration, engine deterioration and sensor calibration errors.

The EGO is a correction derived and applied during Closed Loop and Closed Loop Learn control regimes.

The AFV is a correction derived in the Closed Loop Learn (and Open Loop Learn) regime(s) and is applied in the Open Loop and Open Loop WOT control regimes.

For Buell X1, S3 and XB engines before 2010 model year, the O2 sensor is installed into the rear header only, this is the input to the ECM to calculate the EGO correction. Although the front cylinder's mixture is not monitored by the ECM, EGO and AFV corrections are applied to both cylinders in the same manner.

More advanced EFI systems use additional measurements to improve the accuracy of the air flow calculations. For further reading, see reference 1.

5.1.3 Control loops

Closed Loop Where the ECM corrects it's fuelling based on lambda measurements

Closed Loop Learn Where the ECM corrects it's fuelling based on lambda measurements and calculates a correction to be applied when in open loop

Open Loop Where the ECM increases the fuelling to either richer than stoichiometric (large throttle openings) or leaner than stoichiometric (closed throttle)

Open Loop WOT Where the ECM can further richen the fuelling for wide open throttle operation

These control loops are shown in Figure 6.

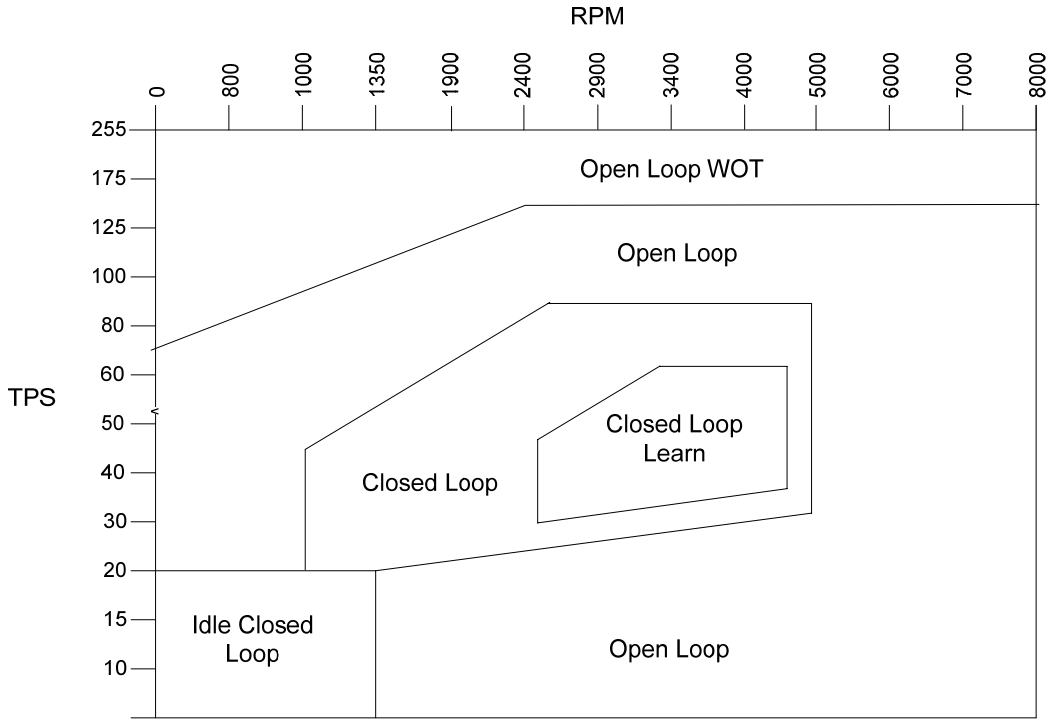


Figure 6 Fuel map schematic showing control loop areas

5.1.3.1 Closed Loop

Closed loop operation is where the ECM constantly monitors exhaust gas oxygen using anarrow band lambda sensor and adjusts fuel levels to deliver a stoichiometric mixture.

In reality, the closed loop mixture bounces either side of stoichiometric, as it balances on the switching point of the lambda sensor output, if you inspect logged data you will see the O2 sensor sends a sinusoidal signal and a correction (EGO) that bounces either side of 100%.

The closed loop area is defined by a TPS and RPM boundary and as standard, this area equates to low to mid throttle positions at low to mid rpm and is shown in Figure 6.

Referring to Figure 1, the fuelling in the Closed Loop region is applied in the following manner:

1. From TPS and RPM measurements, the baseline fuel flow is determined from the front and rear fuel maps, see Figure 6.
2. A factor to account for inlet air density is applied as a function of Inlet Air Temperature.
3. A factor to account for engine temperature is applied
4. A factor is applied, EGO, as part of the closed loop control to correct the mixture to stoichiometric as measured by the lambda sensor.
5. A delta to account for battery voltage is applied

Note that operations 1 to 4 are not necessarily carried out in this order, however the intention is create a fuel flow as close to the target, stoichiometric, as possible.

In addition, the Idle Closed Loop, at the bottom left of the fuel map, Figure 6, operates in the same manner however using different tables for correction.

Also note that the Closed Loop and Closed Loop Learn boundaries change with AFV, this is called Altitude Adjustment.

From an engine operation perspective, the further away the fuelling, driven by 1, 2 and 3, is from stoichiometric, the rougher the engine will feel.

5.1.3.2 Closed Loop Learn

The Closed Loop Learn region is a subset of the Closed Loop region and is where the global correction, the AFV, is calculated to account for all other uncertainties not addressed, these may include; ambient pressure and sensor deterioration. The Closed Loop Learn region occurs at about 40 – 70mph with a steady throttle and is shown in Figure 6.

The fuel is metered the same as in the Closed Loop region, except after 23 iterations of a difference between EGO and AFV, the AFV is reset to equal the EGO correction. Note that the AFV is only calculated in this region when the engine temperature is between [Calibration Mode Maximum Engine Temperature] and [Calibration Mode Minimum Engine Temperature], see section 18.

5.1.3.3 Open Loop

Open Loop operation occurs outside the Closed Loop and Closed Loop Idle regions, see Figure 6.

Open Loop fuel is metered as in Closed Loop, substituting the AFV instead of EGO correction and applying an open loop factor, [Open Loop Default Correction].

The Open Loop region covers the TPS and RPM which are encountered during a transition from Closed Loop to Open Loop WOT and during deceleration. For the former, the AFR needs to provide a smooth transition to WOT and for the latter, the AFR needs to be very lean to ensure the engine returns to idle quickly, to increase the engine braking effect and to reduce the chance of popping and banging in the exhaust.

5.1.3.4 Open Loop WOT

Open Loop WOT operation is shown at the top of the operating envelope in Figure 6.

In the WOT region, by definition, the rider wants maximum power as operation in this region results in high speeds. The choice of AFR is discussed in section 14, stoichiometric trades power for efficiency, hence a mixture richer than stoichiometric is desirable for power and response.

The description of the operation of this loop is the same as Open Loop, but a different user definable factor, the [WOT Enrichment] factor is used.

5.1.3.5 Open Loop Learn function

A neat little ECM function is the Open Loop Learn.

This uses the O2 sensor to detect rich or lean running conditions and operates in two ways:

1. If, during a decel, the ECM detects a rich mixture, the AFV is temporarily reduced.
2. If, at WOT, the ECM detects a lean mixture, the AFV is temporarily increased. This is shown clearly in Figure 7.

For decel operation, the following parameters are applicable:

[Deceleration Learn Maximum RPM]	Upper RPM for Open Loop Learn (decel)
[Deceleration Learn Minimum RPM]	Lower RPM for Open Loop Learn (decel)
[Deceleration Learn Minimum Duration]	Minimum number of cam revs for validity

[Deceleration Learn Minimum Readings]	Number of decels where mixture measured as rich before AFV is reduced

For WOT operation, if the mixture is lean, the AFV is increased. The following parameter is applicable:

[Open Loop Enrichment Delay]	Time at which mixture is lean before increasing AFV

This function can be enabled/disabled through the [System Configuration] Byte, see Figure 8.

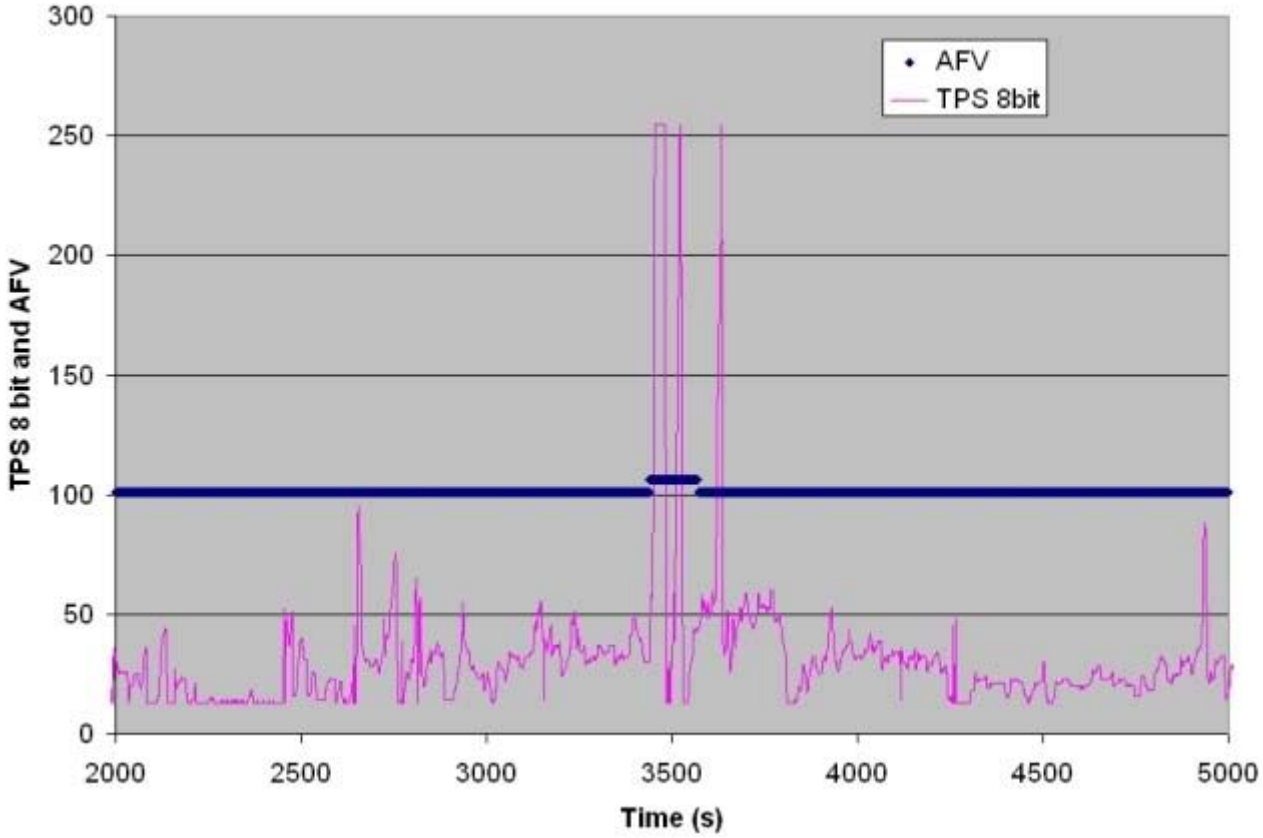


Figure 7 Example of Open Loop Learn operation at Wide Open Throttle

Table value locking in adjustment	Enable real-time table value adjustment	Fuel pump duty cycle lookup enable	Bank Angle Sensor enable	Open Loop Learn enable	Fuel cutoff in decel	Idle closed loop enable	Idle ignition timing adjustment enable
0	1	1	1	1	0	1	1

Figure 8 [System Configuration] Byte definition and example of use

5.1.3.6 Boundary definition

It should be noted that all these region boundaries can be set by the user, however think carefully why you would want to reset them.

See section 18 for:

[Closed Loop Region Upper Boundary]	Definition of Closed Loop region upper boundary
[Closed Loop Region Lower Boundary]	Definition of Closed Loop region lower boundary
[Calibration Mode Region Upper Boundary]	Definition of Closed Loop Learn region upper boundary
[Calibration Mode Region Upper Boundary]	Definition of Closed Loop Learn region lower boundary
[WOT Region]	Definition of WOT region lower boundary

5.1.4 Acceleration Enrichment

Acceleration Enrichment is one of the more complex corrections for changing from one steady state condition to another, comprising several tables and values. Acceleration Enrichment is applied when the throttle is opened fast to richen the mixture and prevent the bike from hesitating whilst giving a fast ans smooth transition between steady state operating points.

The amount of fuel is dependent on the following conditions:

- throttle movement
- engine temperature
- engine speed

The ECM differentiates between a light acceleration and full acceleration condition. To identify such a condition the ECM monitors throttle position and calculates a moving average to smooth the curve and set up a trend value. By default the moving average is calculated using the following formula:

$$TPS_{avg}(n) = TPS_{avg}(n-1) + (TPS_{curr} - TPS_{avg}(n-1)) * 5/64$$

To results of that computation are shown in the table below. The values start with a steady 45° opening of the throttle, which is then opened quickly to full 90° and back again:

Table 6 TPS calculations used for accel enrichment

Sample	1	2	3	4	5	6	7	8	9	10	11	12	13
TPS curr (°)	45,0	75,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	75,0	45,0	45,0	45,0
TPS avg (°)	45,0	45,0	47,3	50,7	53,7	56,6	59,2	61,6	63,8	65,9	66,6	64,9	63,3
TPS Diff. (°)	0,0	30,0	42,7	39,3	36,3	33,4	30,8	28,4	26,2	9,1	-21,6	-19,9	-18,3

A small graph might illustrate the trend better than numbers only:

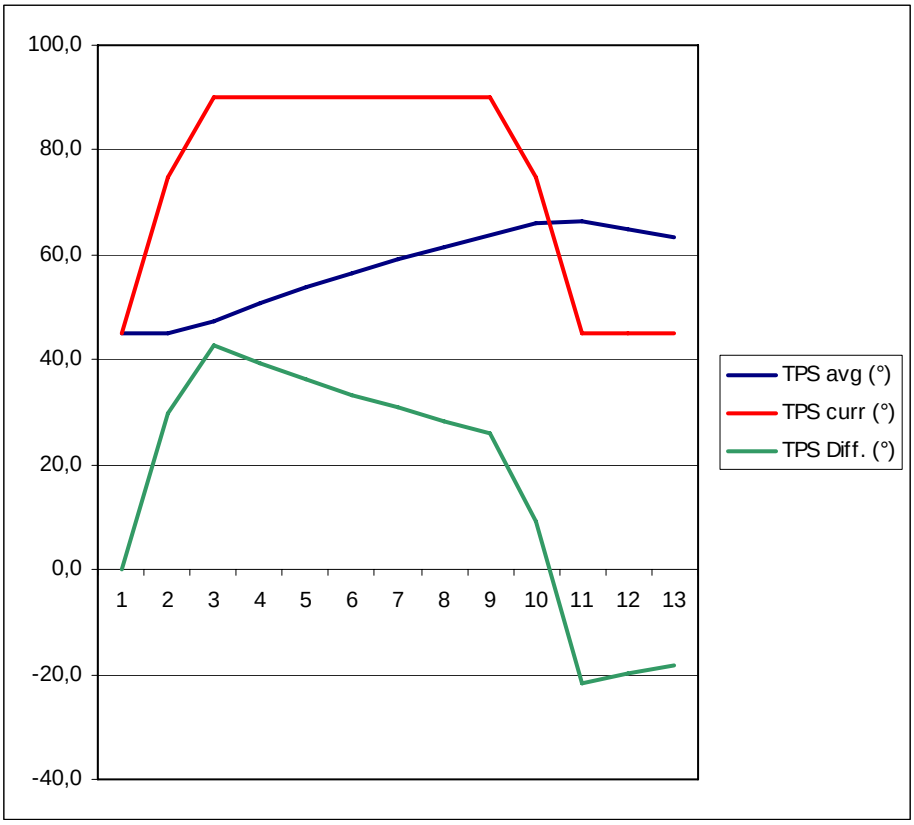


Figure 9 TPS calculations used for accel enrichment

This graph shows the current throttle position, the average throttle position (trend) and the difference between the current and the average throttle position (which will be negative in deceleration conditions also). By default, light acceleration starts at a TPS difference of 0.3°, and full acceleration enrichment is triggered at a TPS difference of 15° - 18°. As long as these conditions are met, acceleration enrichment is active. The amount of fuel added is calculated from the actual throttle position and adjusted to engine temperature and engine speed in two other tables:

Table 7 Applied accel enrichment correction examples

RPM (min $^{-1}$)	Fuel (%)
800	160
1200	125
2500	60
5000	15

Eng.Temp. (°C)	Corr. (%)
0	210
25	130
130	50
220	20

Acceleration enrichment percentage is calculated by throttle movement and RPM first and then temperature corrected according to engine temperature. By default the enrichment lasts one revolution, then the throttle position is evaluated again by the formula given above.

5.2 Ignition control

As shown in Figure 10, ignition control takes the form of a base map, a correction for engine temperature and a configurable function for reducing the advance (less power) for noise abatement. This is discussed more in section 5.4.

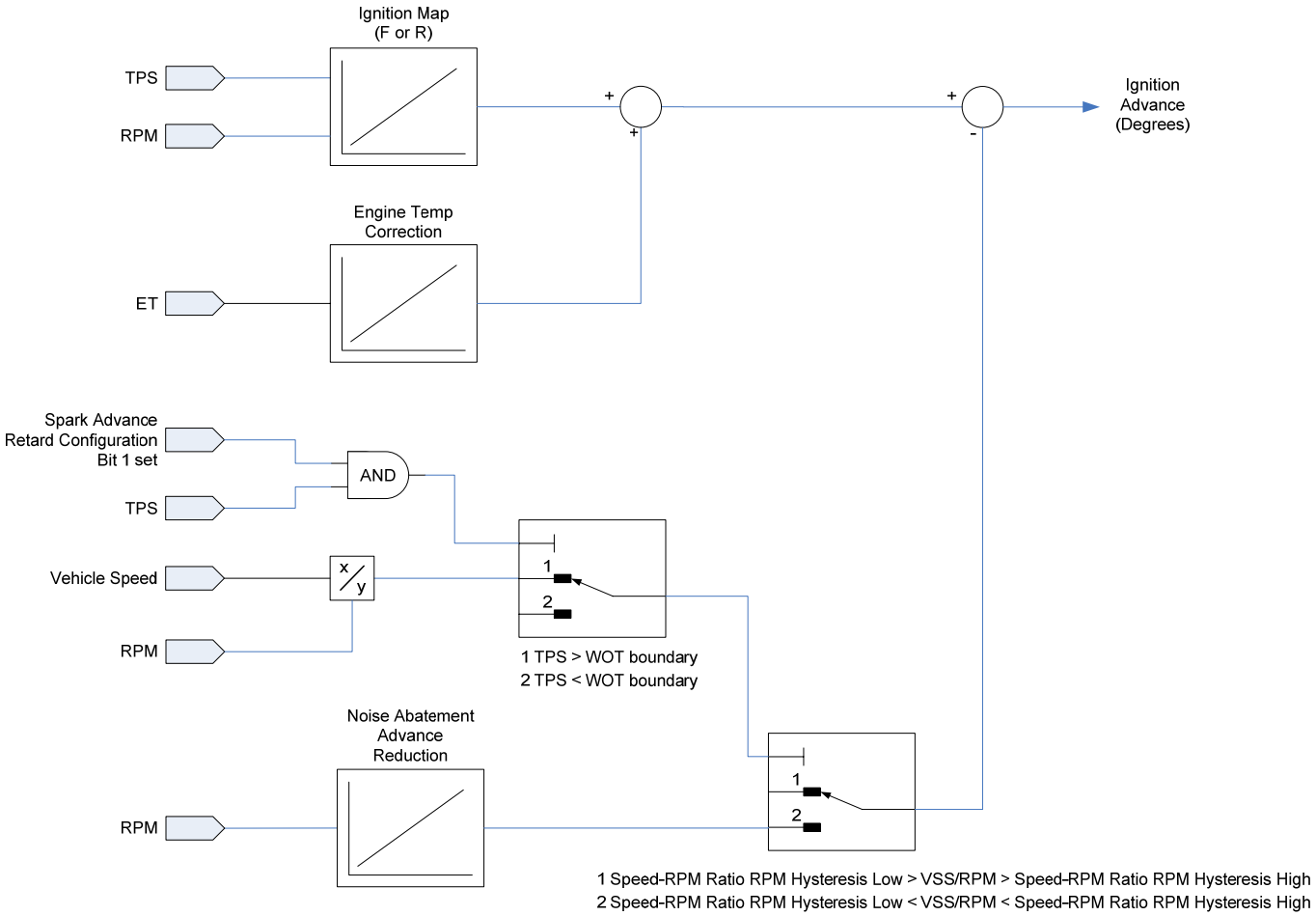


Figure 10 Ignition timing function

5.2.1 Ignition map

As with the fuelling, the starting point for the ECM when deciding the time of the spark is the base ignition map. The Buell ECMs use separate maps for front and rear cylinders.

The fuel map is read as a function of throttle position and engine speed. As with the fuel control, this is known as Alpha-N, where Alpha refers to throttle angle and N refers to engine speed.

Each point in the ignition map describes an advance in degrees multiplied by 4.

5.2.2 Ignition correction at idle

The ECM corrects ignition timing when in Closed Loop Idle. The correction table is defined as additional ignition advance as a function of engine temperature.

See section 18 for [Idle Spark Advance Temperature Adjustment]:

Table 8 Idle ignition advance correction (engine temperature) values example

Eng.Temp (°C)	Additional Advance (°)
0	30
12	21
60	7
160	0

At engine operating temperature, the additional advance over the base ignition map is zero (advance is clamped at 0 degrees at 160 degrees C and above). The base ignition map can be modified to give a smoother idle.

5.2.3 Ignition correction as a function of engine temperature

The ECM has the ability to correct ignition timing when in all control regimes apart from Closed Loop Idle. The correction table is defined as additional ignition retard as a function of engine temperature. On some, if not all, ECMs, this function is not used.

See section 18 for [WOT Spark Advance Reduction]:

Table 9 WOT ignition retard correction (engine temperature) values example

Eng.Temp (°C)	Additional Retard (°)
100	0
180	1
215	2
250	3

5.2.4 Rev limiter

Rev limiting is done in response to either:

- Excess engine speed
- Excess time at a fixed engine speed
- Excess engine temperature

The budding tuner will only be interested in raising the rev limiter for the first two of the above, however, bear in mind that XB and XL engines do not like to be revved much beyond 7000RPM.

Limiting due to excess engine temperature is described in section 17.

5.2.4.1 Engine speed limiting (simple)

The rev limiter operates in three modes:

Soft Skip spark operation - less sparks are skipped than delivered

Hard Skip spark operation - more sparks are skipped

Kill all sparks are skipped

Each mode is configurable by an 8 bit binary word for front and rear. Examples below

Soft (front)

1	1	1	0	1	1	1	0

Soft (rear)

1	0	1	1	1	0	1	1

Hard (front)

0	1	0	1	0	1	0	1

Hard (rear)

1	0	1	0	1	0	1	0

Kill (not configurable)

0	0	0	0	0	0	0	0

Each limiter is triggered on by a speed threshold (usually higher than off) and triggered off by a speed threshold (usually lower than on)

[RPM Fixed Soft Limit Trigger]	typical value 6750rpm for 1200 engines
[RPM Fixed Soft Limit Recharge]	typical value 6700rpm for 1200 engines
[RPM Fixed Hard Limit Trigger]	typical value 6800rpm for 1200 engines
[RPM Fixed Hard Limit Recharge]	typical value 6750rpm for 1200 engines
[RPM Fixed Kill Limit Trigger]	typical value 7000rpm for 1200 engines
[RPM Fixed Kill Limit Recharge]	typical value 6950rpm for 1200 engines

5.2.4.2 Engine speed limiting (time at speed)

The ECM includes a function whereby the ignition can be cut either soft, hard or kill, when the engine has been used above a speed threshold for a set amount of time. This function is recorded as having hampered Buell land speed records.

[RPM High Speed Hysteresis High Value]	High speed threshold, hysteresis pair typical value 120
[RPM High Speed Hysteresis Low Value]	Low speed threshold, hysteresis pair typical value 110
[RPM High Speed Timed Limit Timer Start]	RPM limit timer start point, high speed typical value 6300rpm
[RPM High Speed Timed Limit Timer Reset]	RPM limit timer reset point, high speed typical value 6000rpm
[RPM High Speed Timed Hard Limit]	Timed RPM limit, high speed, high typical value 6400rpm
[RPM High Speed Timed Soft Limit]	Timed RPM limit, high speed, low typical value 6300rpm
[RPM High Speed Timed Soft Limit Delay]	Soft RPM limit delay, high speed typical value 10 seconds
[RPM High Speed Timed Hard Limit Delay]	Hard RPM limit delay, high speed typical value 12 seconds Setting either time to 255 disables them
[RPM Low Speed Timed Limit Timer Start]	RPM limit timer start point, low speed typical value 6300rpm
[RPM Low Speed Timed Limit Timer Reset]	RPM limit timer reset point, low speed typical value 6000rpm
[RPM Low Speed Timed Hard Limit]	Timed RPM limit, low speed, high typical value 6400rpm
[RPM Low Speed Timed Soft Limit]	Timed RPM limit, low speed, low typical value 6300rpm

[RPM Low Speed Timed Soft Limit Delay]	Soft RPM limit delay, low speed seconds	typical value 3
[RPM Low Speed Timed Soft Limit Delay]	Hard RPM limit delay, low speed seconds	typical value 5
	Setting either time to 255 disables them	

5.3 Active Muffler control / pressure measurement and correction

The Active Muffler Control (AMC) is used on the XB12 range. It shares the ECM inputs with pressure measurement for fuel map correction.

Only one of these functions can be used. The default is the AMC.

5.3.1 Active Muffler Control

The AMC serves two purposes; to improve mid-range torque and to decrease noise. The AMC is covered by the patent US 7,347,045 B2.

5.3.1.1 Operation and effect

The AMC is operated by the servo motor located under the airbox cover. A configuration byte, [Active Muffler Configuration] controls the mode of operation and including continuous operation or operation only at WOT (default), see Figure 11.

Unless there is a lot of dyno time, the settings can be left alone.

Not used	Not used	Not used	Not used	AMC off when power limiting feature active	AMC polarity (1: AMC off == output on)	1: AMC on when not in WOT condition	Only actuate valve if in WOT condition
1	0	0	1	1	0	0	1

Figure 11 [Active Muffler Configuration] Byte definition and example of use

The operation for a 2005 XB12R is described below.

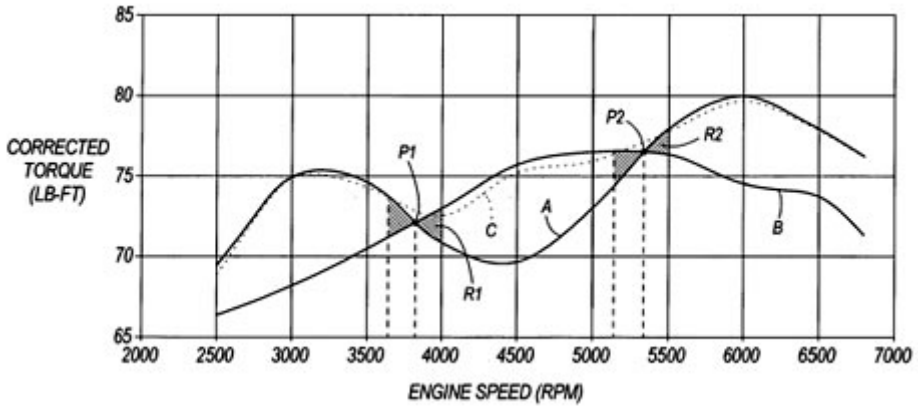


Figure 12 Effect on torque

Where:

1 AMC off (closed = long pipe) below 1450 RPM (low value of hysteresis pair for region 1)
2 AMC on (open = short pipe) above 1500 RPM (high value of hysteresis pair for region 1)
3 AMC on (open = short pipe) below 3300 RPM (low value of hysteresis pair for region 2)
4 AMC off (closed = long pipe) above 3350 RPM (high value of hysteresis pair for region 2)
5 AMC off (closed = long pipe) below 5050 RPM (low value of hysteresis pair for region 3)
6 AMC on (open = short pipe) above 5100 RPM (high value of hysteresis pair for region 3)

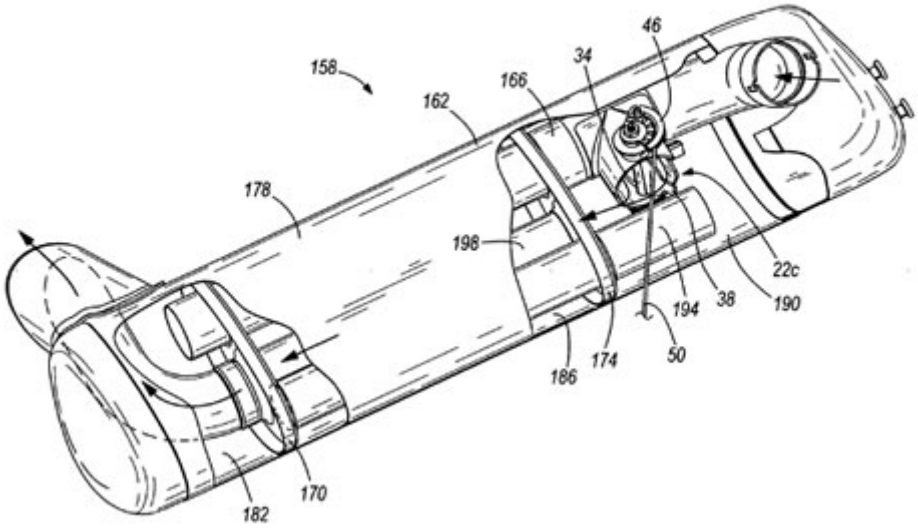


Figure 13 Open / AMC on

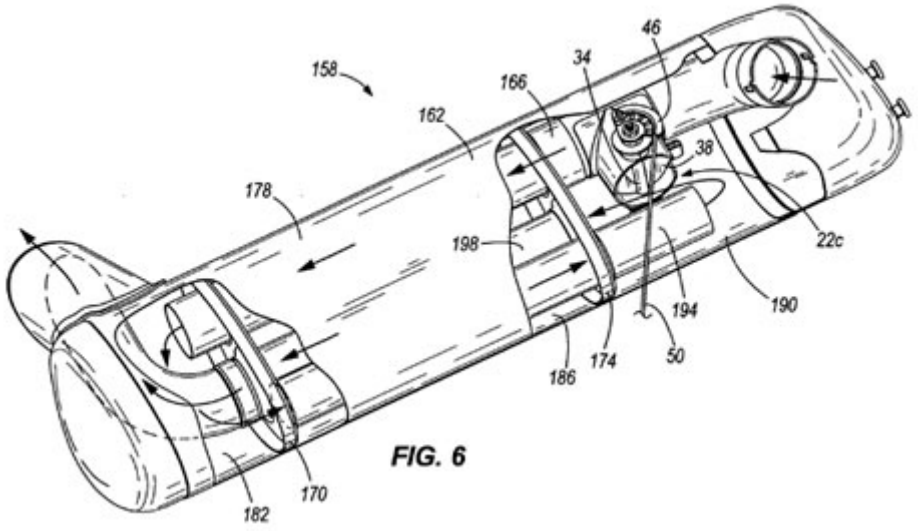


Figure 14 Closed / AMC off

5.3.1.2 Removal

Most aftermarket pipes do not feature the AMC, which makes the servo motor unnecessary. You can either do one of the following:

1. Leave the motor connected either with the cable disconnected at the motor or at the muffler.
2. Create a false motor, see Figure 15.
3. Disconnect the motor connector and/or remove motor, this will result in the Check Engine Light (CEL) being illuminated but will give you space under the airbox cover for other accessories. The CEL can be “turned off” by inhibiting the error checking in Byte 5 of the Enabled Diagnostics, EDiag.

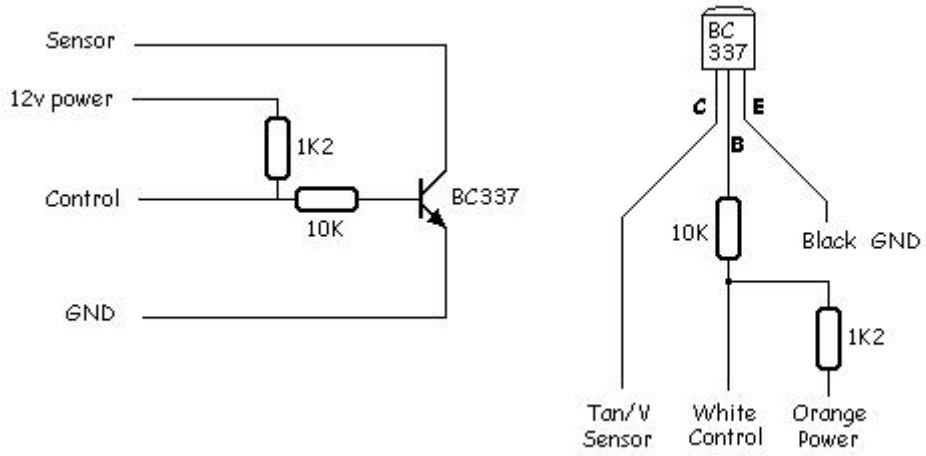


Figure 15 False servo motor circuit design

5.4 Noise Abatement Logic

The XB9 bikes up to and including 2007 model included logic to retard the ignition timing at conditions corresponding to noise test points.

This results in a flatspot at around 3000 RPM.

The simple way around this is to remove the speed input to the ECM, this is a white wire on the grey ECM connector, and hence this modification has become known as The White Wire Mod.

The ECM uses this as one of the criteria for retarding the ignition to meet noise legislation and hence the function can be muted in the ECM.

5.4.1 Logical disconnection

Logical disconnection involves setting the [Spark Advance Retard Configuration] byte to turn the function off. This is defined in Figure 16. A typical configuration for the function turned ON is shown in Figure 17, a typical configuration for the function turned OFF is shown in Figure 18. Note the unsetting of bit 1, 'Activate on WOT transition'. Turning off this one bit is a surgical operation, however setting the whole byte to zero works equally as well, and is used on the Parts and Accessories (P&A) Race ECMs.

Stop accel enrichment when activated	Enable ramp out	Deactivate when no accel	Deactivate when leaving WOT	Use initial values	Activate only if accel and WOT	Activate on WOT transition	Activate on accel

Figure 16 [Spark Advance Retard Configuration] byte definition

1	1	0	1	1	0	1	0

Figure 17 Typical configuration for the function turned ON

1	1	0	1	1	0	0	0

Figure 18 Typical configuration for the function turned OFF

5.4.2 Physical disconnection

1. Locate the ECM
2. Remove the grey connector
3. Remove seal and place somewhere safe

4. Carefully prise out the orange retainer using a small electricians screwdriver (indentations already there to help on the sides)

5. Locate the white wire at pin 8 (small numbers are present on the back of the connector)

6. Pull on the white wire whilst holding back the locating tag inside the plug

7. Once removed, refit the orange retainer, replace the seal and plug the grey connector back into the ECM

8. You MUST insulate the removed terminal as it's connected to the VSS and speedometer (heatshrink is good) and then cable tie it back to the loom.

6 Tuning methods

Depending on what you want to get out of the bike and what instrumentation you have available, the tuning method may be different.

6.1 Tuning goals

The tuning goals should be, starting from the bottom of the map up:

1. A stable idle
2. Good fuel economy and smooth running at fixed speed (cruise)
3. Good response when you open the throttle, however much
4. As much power as possible at wide open throttle
5. Good pop free engine braking when you shut the throttle from load
6. A prompt return to idle when blipping the throttle with the engine unloaded

6.1.1 Keeping the standard control regions

This means to use the Closed Loop, the Closed Loop Learn, the Open Loop and the Open Loop WOT regions and of course keeping the O2 sensor connected.

This is the favoured method because it keeps the control simple and maintains the protection of Open Loop Learn etc. and accommodates changes in atmospheric pressure.

6.1.2 Turning off the lambda (O2) sensor

This leaves the engine with no correction for atmospheric pressure, compensation for intake ram effects, or correction for running lean at WOT.

6.1.3 Either of the above with pressure compensation correction

The lambda sensor input to the ECM is removed and a pressure sensor is used to allow compensation to be made to the fuelling based on inlet pressure changes. Depending on the position of the sensor and the configuration in the ECM, this method can also be used for forced induction systems, either turbo-charging or ram effect.

6.2 Target AFRs

Figure 19, based on Figure 3, shows the target AFRs for mapping to achieve the tuning goals in section 6.1.

The AFR is only really practically measured using a lambda sensor. In days of old, “plug chops” could be performed, however due to the inaccuracy of this method and the location of the plugs on Buell XBs and the later Helicon engines, this is discouraged.

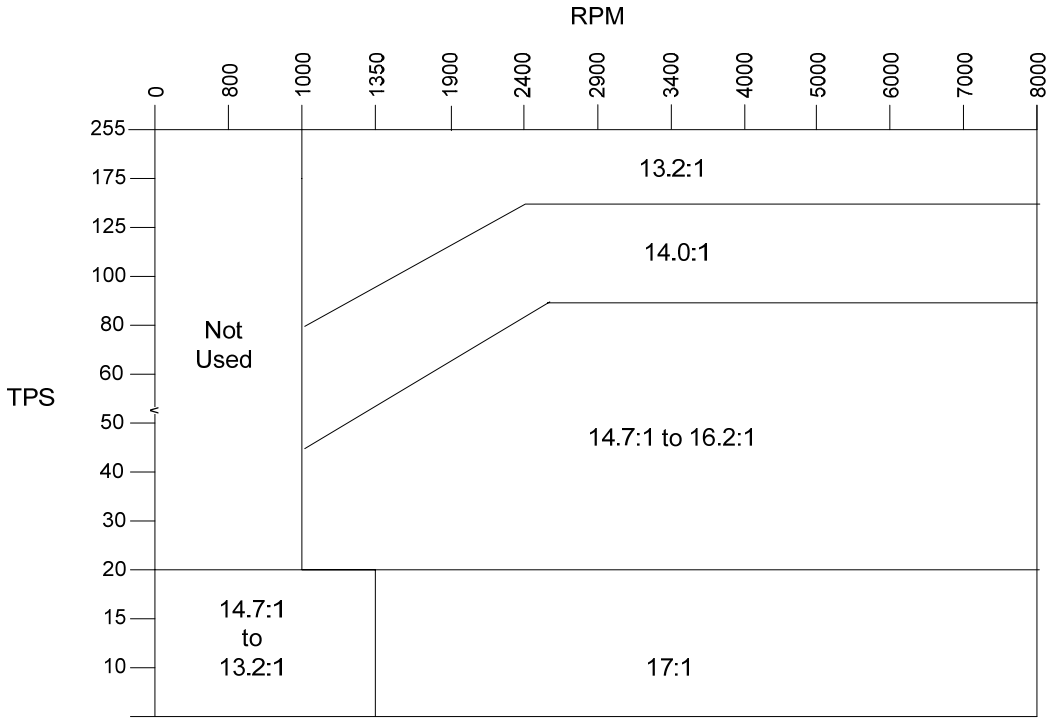


Figure 19 Target AFRs for tuning goals

6.2.1 Stable idle

A stable idle is possible in closed loop, i.e. at 14.7:1 AFR under the standard control regimes. Increasing to 13.2:1 will make it crisper. Some tuning manuals, such as reference 3, suggest richer mixtures, however this is likely to be aimed at carburettored applications where wall wetting, due to poor atomisation, is more likely to occur.

6.2.2 Good fuel economy and smooth running at fixed speed (cruise)

Everything has a time and a place. Max power is needed when you want it, but when you are at cruise, you want the fuel in your tank to last between fuel stops, you want to minimise the amount of times you need to stop and you want to benefit from the amount of money NOT spent on fuel so you can spend it on more tuning goodies.

Figure 43 in Section 15 shows the relationship between efficiency, power and AFR.

For the standard control regimes, you are limited to an AFR of 14.1:7, for DDFI and DDFI-2, this is only on the rear cylinder. For DDFI-3, you are limited on both cylinders. Since the front and rear maps can be modified independently, on DDFI and DDFI-2, the front can be made to run leaner to reduce fuel consumption further.

By turning off the lambda sensor, you can run leaner which may allow you to run more efficiently. Some engines will run leaner than others without undue cycle by cycle variation (misfire) which ultimately results in more fuel burn.

Target AFR here is 14.7:1 for the closed loop controlling cylinder on the standard control regime, or between 14.7:1 and 16.2:1 on the closed loop non-controlling cylinder on the standard control regime or when the lambda sensor is turned off.

6.2.3 Good response when you open the throttle, however much

The accel enrichment controls this facet.

6.2.4 As much power as possible at wide open throttle

Back to Figure 43 in Section 15 shows that max power occurs at an AFR about 10% richer than sotichiometric. This is backed up by the findings of the case study in section 8.1. Target AFR for max power is 13.2:1. A zone of wider opened throttle than cruise is set up as a bridge, the target AFR here is 5% richer than stoichometric to smooth the transition, i.e. 14.0:1 AFR.

6.2.5 Good pop free engine braking when you shut the throttle from load

Popping in the exhaust is caused by unburned fuel and air, often available due to leaks in the exhaust joints. With carburettored engines, closed throttle is a compromise for this region as a result of the attention given to a stable idle. With a fuel injection system, the fuel can be cut to almost zero during high speed closed throttle use. Cutting the fuel to zero will, however, result in poor respose when the throttle is opened again. Target AFR here is leaner than stoichiometric, perhaps 17:1, but can be adjusted easily to achieve the response required with no popping.

6.2.6 A prompt return to idle when blipping the throttle with the engine unloaded

Connected to the above, however an overshoot where the engine runs down below idle is a pain in the ass. A slight ramp up on fuelling towards stoichiometric for the last 1000 rpm is needed here.

6.3 Type of lambda sensor

Section 14 discusses the two types of lambda sensors which are commonly used for tuning, the Narrowband and Wideband varieties.

The use of each depends on what your goal is, referring to section 6.1;

6.3.1 Keeping the standard control regions

Since the standard O2 sensor will be used for control when tuning is complete, the standard O2 narrow band sensor needs to be used to set up in the Closed Loop and Closed Loop Learn for the rear cylinder.

As discussed, the standard O2 sensor cannot measure AFR accurately other than stoichiometric (14.7:1 for gasoline fuelled vehicles), therefore for any region outside the Closed Loop and Closed Loop learn, a Wideband sensor is required.

The above statement is disputed by some, however evidence to support is presented in 14.

6.3.2 Turning off the lambda (O2) sensor

Since there will no longer be any closed loop mixture control on the engine, it is now important to understand the AFR at all fuel map conditions. For this reason, a Wideband lambda sensor is needed.

6.4 Number of lambda sensors required

Since the engine is an inline V twin, the rear cylinder is going to run hotter than the front due to the reduced cooling effect. In addition to this, the standard headers, and the majority of aftermarket headers, join the front and rear cylinders at a junction (or collector). As a result, the speed at which peak volumetric efficiency occurs will differ between front and rear.

The standard engine is fitted with a lambda sensor in the rear header, close to the port, as can be seen from Figure 20 in the top left. Obviously, this lambda sensor can only tell you what is going on

in the rear cylinder. If you tune with a single lambda sensor, you need to make some assumptions about the unsensored (front) cylinder.

Figure 20 Modified standard headers (XB12) showing standard lambda sensor boss on rear header and additional bosses upstream of the collector

6.4.1 Tuning with one lambda sensor

As discussed above, if you intend to tune with one lambda sensor, you need to make some assumptions about the unsensored (front) cylinder. The easiest to make is that the shape of the map is correct and that any % changes to the rear cylinder should equally apply to the front.

This assumption is only valid if the map pair being modified is applicable to the exhaust fitted, particularly the headers, and that the map pair was created accurately, i.e. not cobbled together assuming that the ECM will correct for big errors.

If using a Wideband sensor in the standard boss, be sure that, it will fit without being damaged by the fan.

6.4.2 Tuning with two lambda sensors

The advantage of tuning with two lambda sensors is that you will know exactly what is going on in each cylinder. Tuning with two lambda sensors simultaneously, rather than swapping one lambda sensor between front and rear, will allow you to see any interaction between cylinders made by a change in fuelling to one of them.

At least on additional boss will need to be welded onto the headers. The additional boss(es) need to be placed as close to the exhaust port as possible, for minimal lag in measurement and to avoid measuring any interacting exhaust gas from the other cylinder, whilst allowing the sensor and heater wires to be routed without fouling.

If tuning with the standard control regimes and retaining the stock O2 sensor, it is advisable to mount two slave sensor bosses, for two reasons:

1. Even though most wideband sensor packages allow two outputs simultaneously, WB and simulated NB, the NB output may not be identical to the stock sensor, and you should not be setting maps up to work with a sensor you are not going to be using in service.

2. Some WB sensors cannot deliver enough current to maintain the output voltage when connected to a Buell ECM due to the low input impedance of the ECM. In simple terms, the ECM will measure the AFR erroneously. The Innovate LC-1 suffers from this issue, whereas the Tech-Edge is reported not to.

Of course, slave O2 sensors do not have to be positioned on the pipe, but can be mounted externally, measuring the O2 content of the exhaust by drawing off gas using a vacuum pump. This system works OK on a dyno, however no so if you want to set your maps up when riding the bike. This method introduces a lag into the system, as there will be an additional delay between the exhaust stroke and the sensor reading. This will be a function of engine speed, vacuum pressure and pipe length.

7 Methods

7.1 Overview

The flowcharts presented here are intended to cover every eventuality. Not everybody has a wideband lambda sensor, not everybody has access to a dyno, however, the cornerstone of all these methods is the use of the ECM's EGO correction to tell you what the fuelling needs to be in the Closed Loop areas.

It couldn't be simpler to set up these regions, the use of datalogging allows you to tune your bike for real world operation. Far more enjoyable than slaving over a dyno to set a bike up in an environment it will never run in. Don't misunderstand me, a dyno has it's place, especially for setting up the open loop areas and for finessing the ignition.

Logs need to cover as much of the fuel map as possible, so 30 minutes is probably a minimum, with some town riding and some out of town riding, just rolling on the throttle and rolling off.

As you log, understand your bike and how it is responding, make mental notes as you ride and write them down at the side of the road noting the time when things happened.

A helpful trick is to mark the throttle at different positions so you can equate back to the ECM maps. This is a necessity for some of the methods presented later.

Setting your closed loop learn areas up will result in a stable AFV close to 100%. After remapping, and after a few rides, check the AFV again, it should be close to 100, possibly between 95 and 105. Don't get hung up on the AFV, it is there to account for any changes that the sensors on the bike cannot account for. From day to day the AFV will change.

7.2 Pre-requisites

As well as ensuring your bike is in mechanically sound condition, with no air leaks in the intake, nor the exhaust, the pre-requisites are:

i. Save the current EEPROM content

ii. Check the static timing

iii. Set the TPS

iv. Note the AFV and multiply both front and rear maps by it's value

v. Set the AFV to 100%

Failure to save the EEPROM means you have no baseline to return to, for example if you put the stock exhaust on or if this tuning experience is too much for you…

Failure to set the TPS could mean that your ECM will be reading from the wrong point on the map, in which case all your hard work will be done to a setup which can probably never be replicated.

Multiplying the maps by the AFV and resetting it means that you will be remapping with the open loop area factored correctly in relation to the closed loop learn area. Sure this can probably be bettered as part of the mapping exercise, but you need to go into battle with your strongest army.

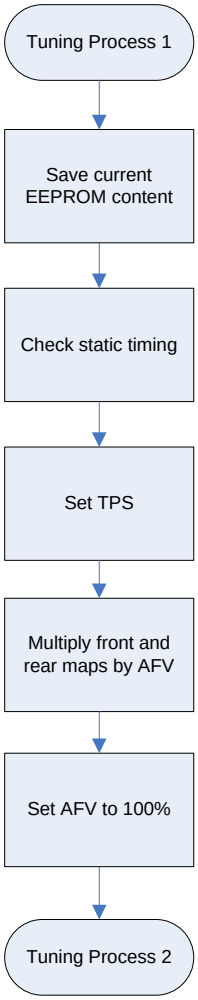


Figure 21 Pre-requisites

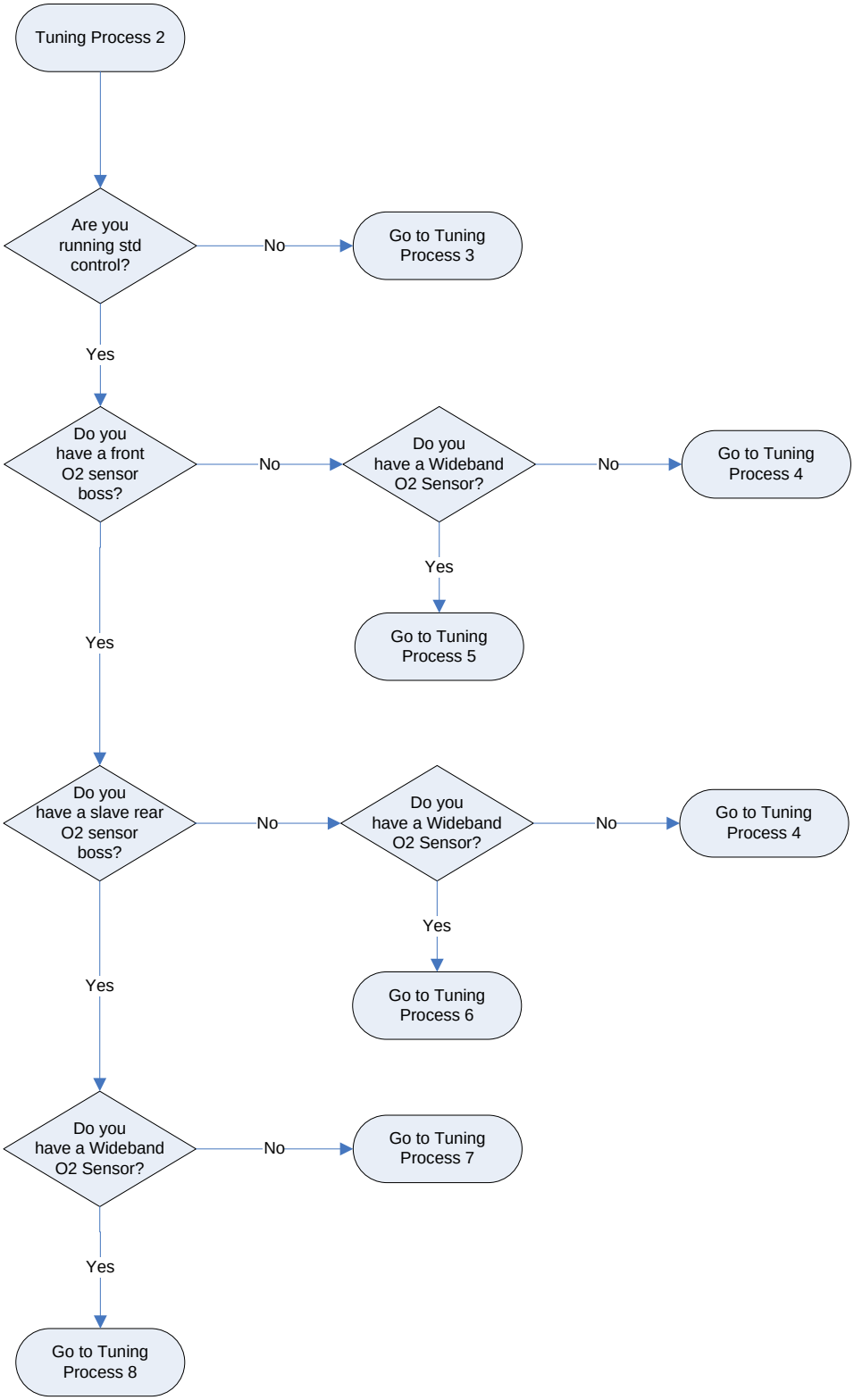


Figure 22 Process finder

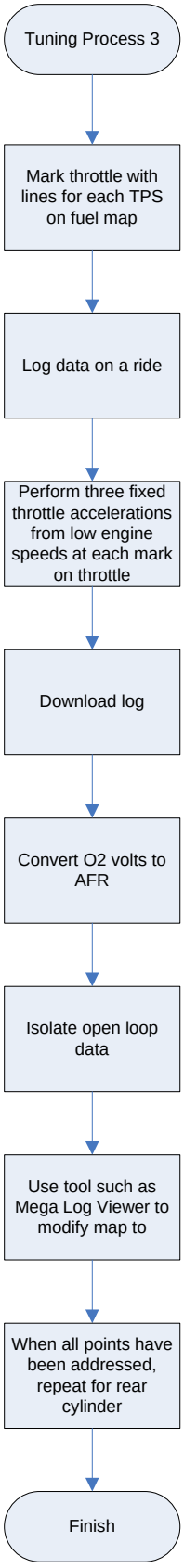


Figure 23 Method for O2 sensor disconnected

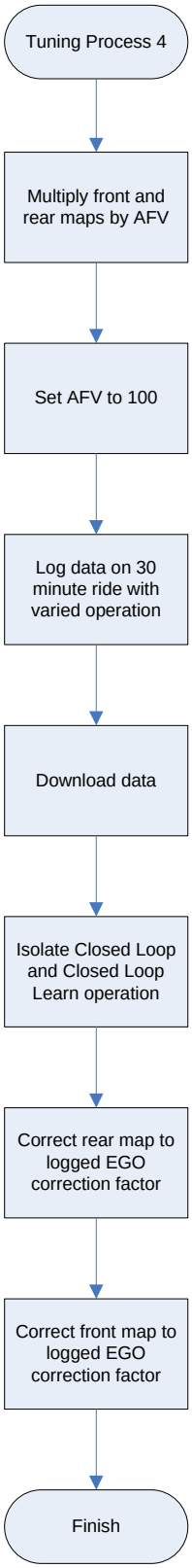


Figure 24 Method for NB sensor in rear boss

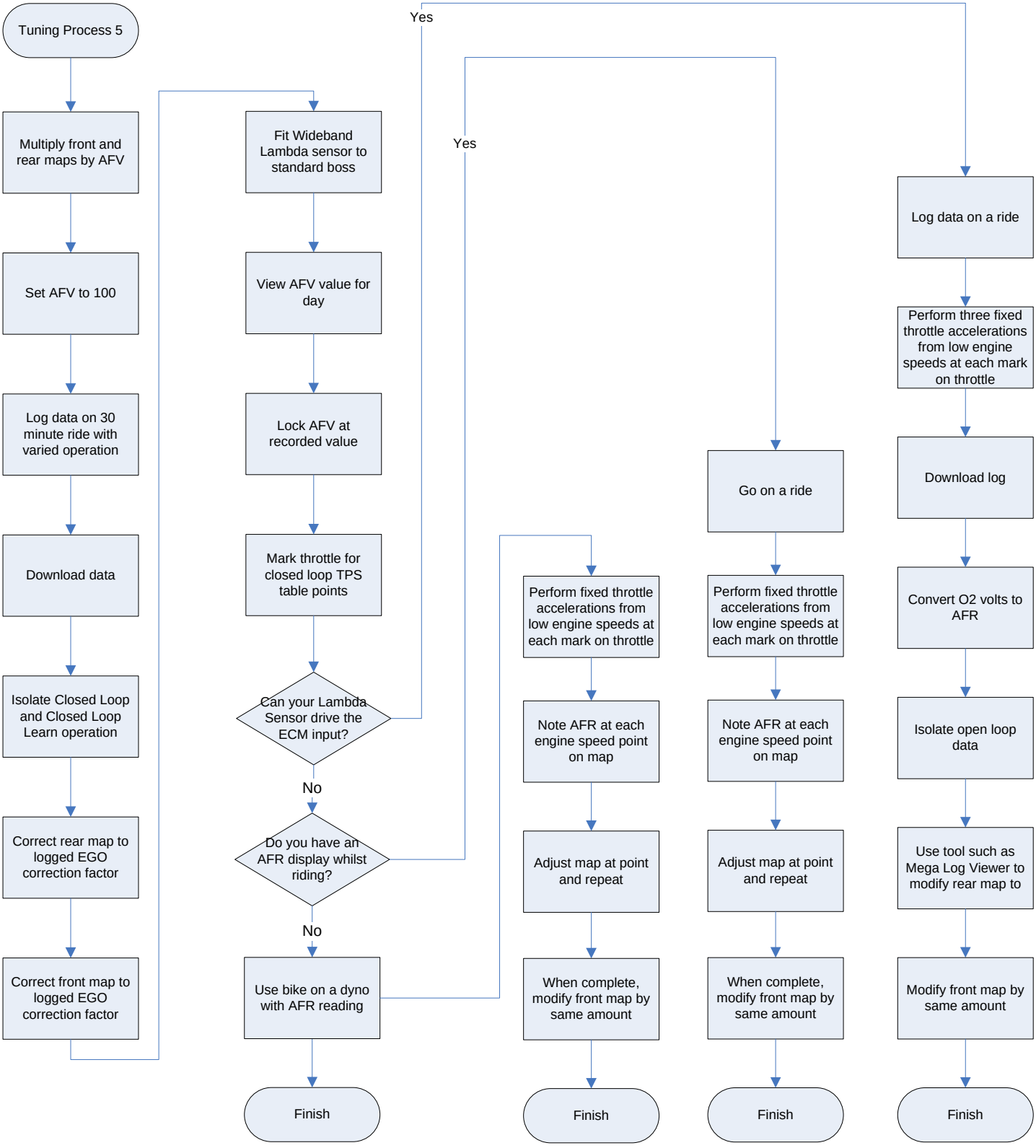


Figure 25 Method for NB sensor and WB sensor in rear boss

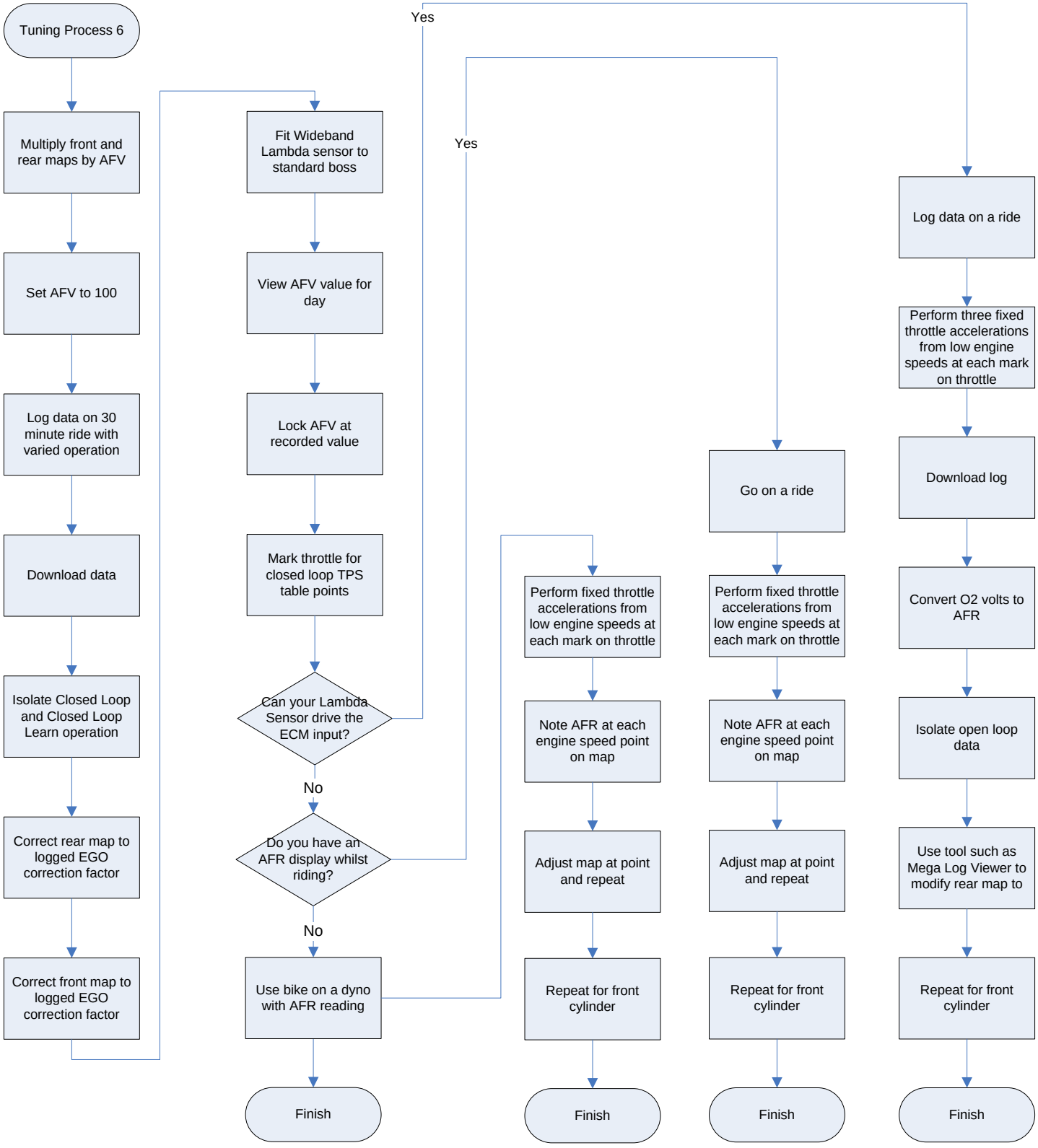


Figure 26 Method for NB and WB sensor is front and rear bosses

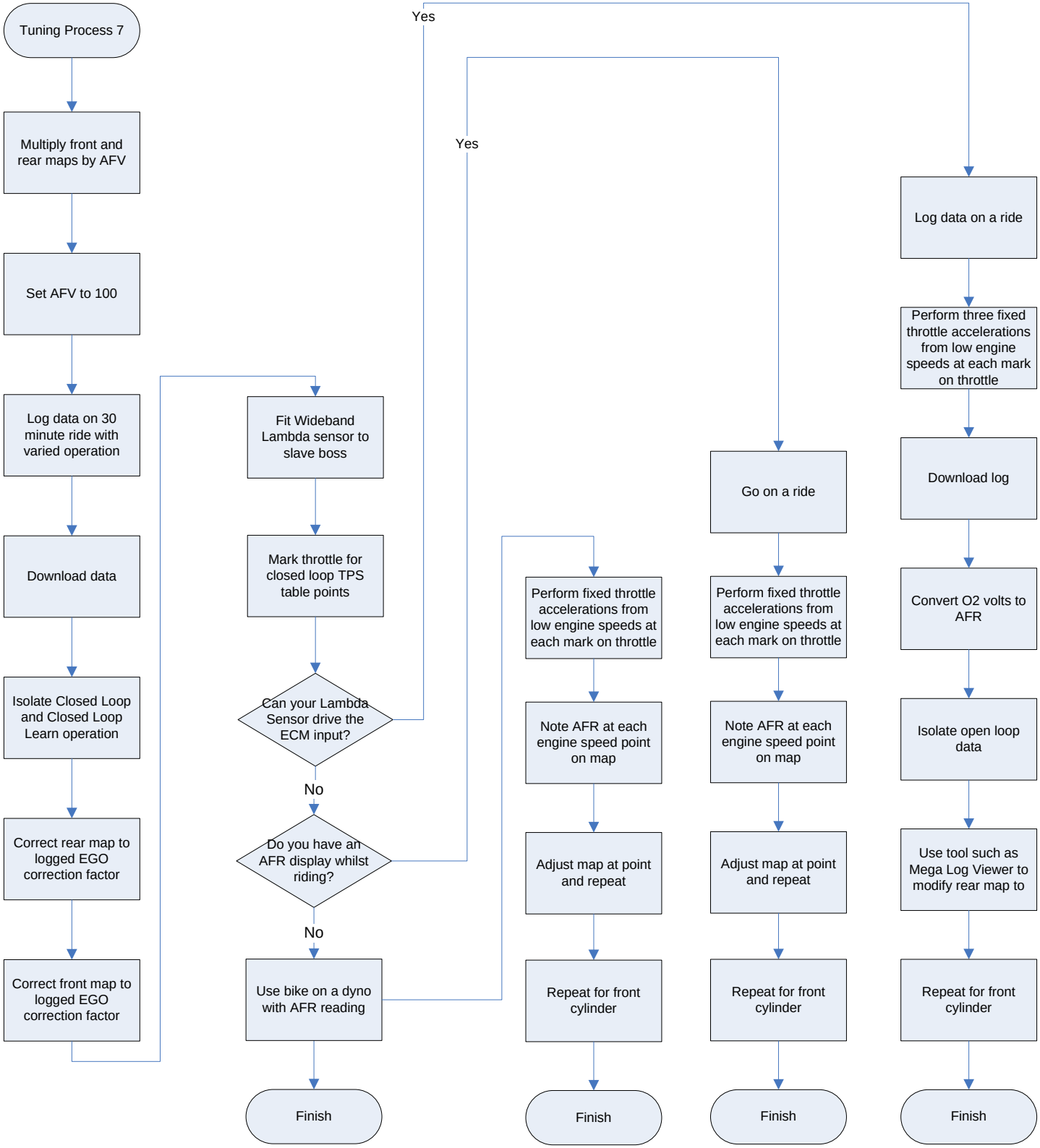


Figure 27 Method for NB and WB sensor in front and slave rear bosses

8 Case studies

8.1 Tuning of XB12R – Ti Force exhaust – standard control regime

This case study follows the generation of maps on an XB12R to work with a Ti Force exhaust and K&N filter using the standard control regimes.

The following steps were taken:

1. Disable error checking for the AMC servo removal
2. Installation of slave lambda sensor bosses
3. Setting up of Closed Loop, Closed Loop Learn and Idle Closed Loop on the rear cylinder
4. Setting up of Closed Loop, Closed Loop Learn and Idle Closed Loop on the front cylinder
5. Setting up of Open Loop Wide Open Throttle and Open Loop at high throttle openings
6. Setting up of Open Loop at closed throttle
7. Tidying up of idle

8.1.1 Disable error checking for the AMC servo removal

See section 5.3.1.2.

8.1.2 Installation of slave lambda sensor bosses

Figure 28 Modified Ti Force headers (on the bench)

Figure 29 Modified Ti Force headers (fitted)

Figure 30 Bike with two Innovate LC-1 Wideband Lambda Sensors and controllers fitted

8.1.3 Setting up of Closed Loop, Closed Loop Learn and Idle Closed Loop on the rear cylinder

Due to the number of points in this region, tuning was carried out by logging data using ECMSpy on a Palm E2 using the standard O2 sensor in it's boss. Data was filtered out from other regions including that with acceleration enrichment using Excel (although this could have been done using Mega Log Viewer):

1. Data was discarded where the engine temperature was less than 150 deg C as the engine would not be close to its operating temperature. Engine temperature during a 90 minute ride is shown in Figure 31.
2. Data was discarded where the [WOT Enrichment] and [Open Loop Default Correction] did not equal 100, i.e. when the engine was operating in Open Loop WOT or Open Loop. This could have been done using the "Engine Byte" in the log.

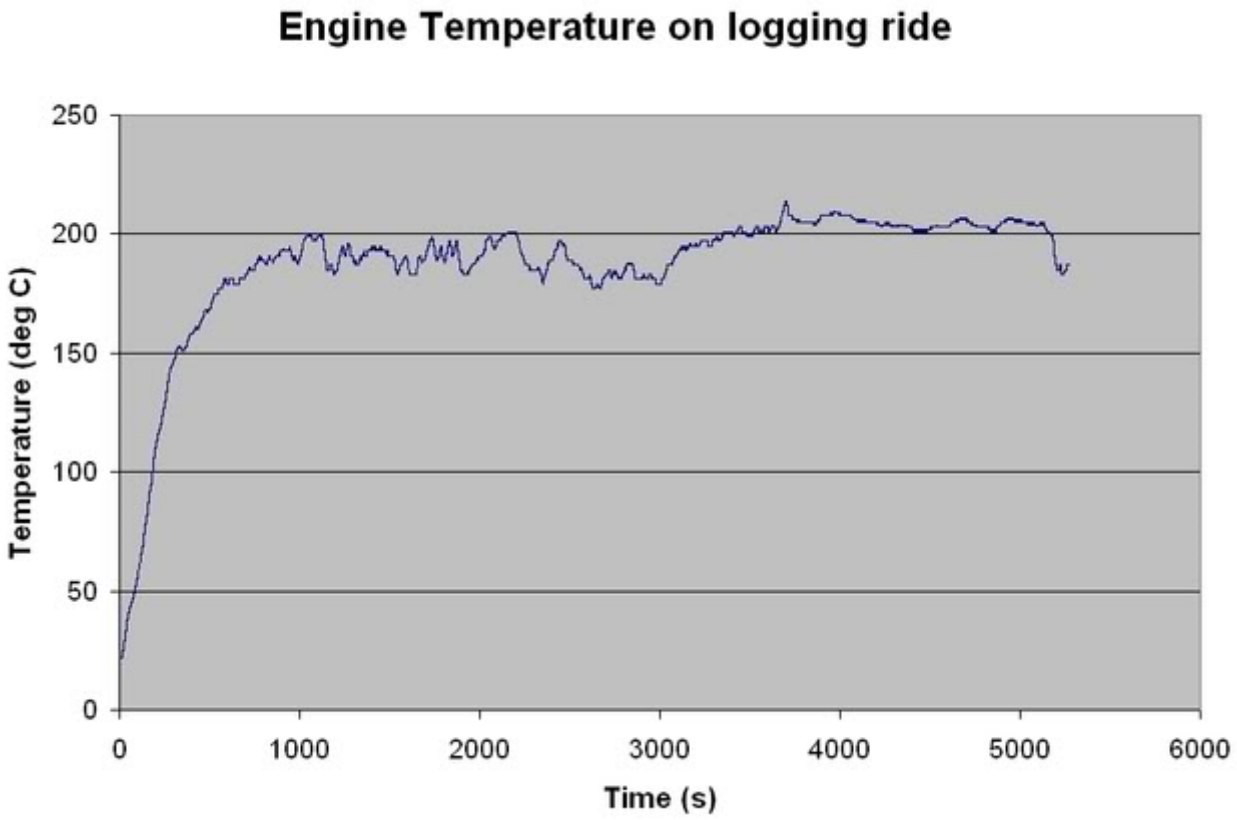


Figure 31 Engine temperature during a 90 minute ride

The VE Analysis tool from MegaLogViewer was used with the ECM's correction (GEGO) only (note that the O2 sensor measurement was not used as was already accounted for in the GEGO) to correct the map at each part visited. Logging was repeated a further two times and the map corrected once again.

Each time the analysis was repeated, the differences invoked on the map became smaller.

8.1.4 Setting up of Closed Loop, Closed Loop Learn and Idle Closed Loop on the front cylinder

The above was repeated for the front cylinder using a second heated narrowband sensor mounted in the slave lambda sensor boss welded to the front exhaust.

8.1.5 Setting up of Open Loop Wide Open Throttle and Open Loop at high throttle openings

The Open Loop region was set up on the dyno using the dual LC-1 sensors in the front and rear, supported by the Innovate Log Works software.

The dyno emissions meter was only able to measure the combined output from both cylinders at the exhaust exit, the tube was difficult to push up the exhaust into the rear or front headers and will have suffered from considerable lag compared to the slave sensors.

Runs were made at 255, 175 and 125 TPS 8bit, dyno parameters were recorded with the output from the emissions measurement equipment. In addition, during each run, the LogWorks screen and engine parameters, using the ECMSpy overview page, were monitored.

The 255 line was the hardest as we had to work hard to define the shape of the front and the rear independently, as dictated by the inlet and exhaust interaction. We repeated this about 20 times.

With that done, the values for the 175 line were estimated based on the values derived for WOT, and trimmed over about 4 runs. The same method was used for the 125 line.

Best performance on the 255 (or WOT) line was given by aiming for 13.2:1 AFR for front and rear. As a test, fuelling was increased to give 12.5:1 AFR, but we saw no discernable difference and if anything, a slight reduction in power.

The ignition advance was also increased by 2 degrees but again, we saw no discernable difference.

Power was up to 90 rwhp from low 80s, see Figure 32, as a result of turning the stock fuel map into something that works with the Ti Force. This result is not far off what Ti-Force advertise the system as giving, see Figure 33.

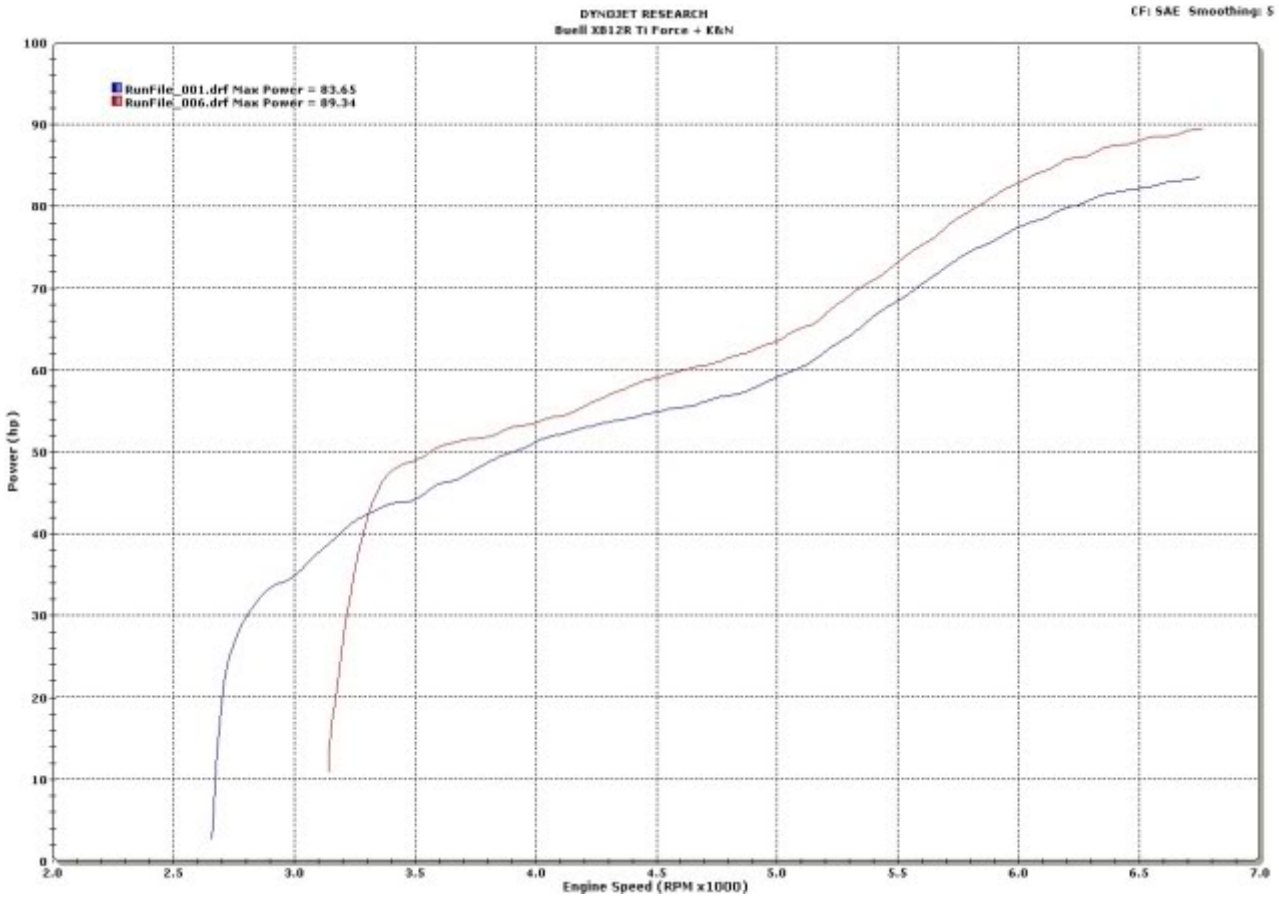


Figure 32 Comparison between WOT dyno runs pre and post tuning

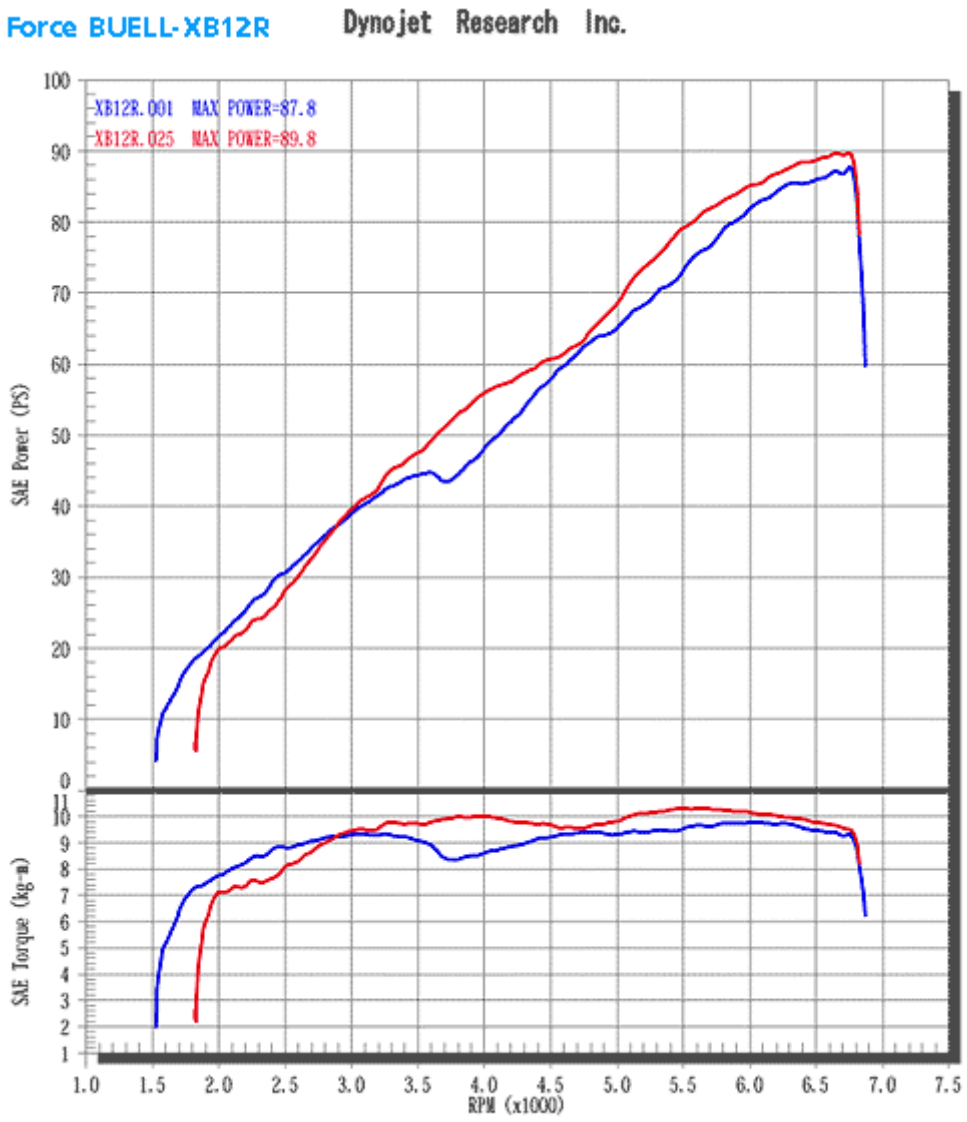


Figure 33 Ti-Force publicity dyno chart

After the dyno time, the resulting new maps gave a huge boost in the last 2000 RPM.

8.1.6 Setting up of Open Loop at closed throttle

Before the mapping exercise was started, the exhaust would pop and bang on the over-run and the engine was sometimes a little slow to reach idle. To correct this, the TPS was determined at closed throttle and all map entries from 2300rpm upwards were set to a value of 10.

8.1.7 Tidying up of idle

As a result of setting up the Closed Loop areas, the idle mixture setting was complete, however the ignition timing was not optimised. Since the idle region is defined with a closed throttle, ignition advance was not going be knock limited. Timing in the idle region is corrected as a function of temperature , see 5.2.2, however the base map for DDFI and DDFI-2 is set for zero advance.

For optimisation, the base map was increased in steps of 2 degrees until engine speed stopped increasing. At this point, the idle screw was adjusted to bring the idle speed back down to 1050rpm. The result with the fuelling changes was a more stable idle at steady state and on engine deceleration.

8.2 Tuning of XB12X – Drummer Original exhaust - deleted O2 sensor with pressure compensation

This project was carried out with no lambda sensor input to the ECM. A pressure sensor was selected and connected to the ECM and the ECM configured to use it. Pressure compensation is discussed in section 19.

8.2.1 Pressure sensor selection

The pressure sensor used was an MPX4250AP[1]. Only pins 1 to 3 are used, as shown in Table 10.

Table 10 MPX4250AP pin outs

Pin	Function
1	V_{out}
2	Ground
3	V_{cc}

For this reason, pins 4, 5 and 6 can be cut off at the case, as shown in Figure 34.

Figure 34 MPX4xxxAP case with non-function pins removed

As directed by the pressure sensor data sheet, capacitors were soldered across the sensor terminals. The sensor was powered from the 5V sensor power and sensor ground (pins 1 and 7 respectively of the grey ECM connector).

8.2.2 ECM configuration

AFV was set to 100% and limited by setting [AFV Maximum Value] and [AFV Minimum Value] to 100%

The O2 sensor operation was turned off by setting [O2 Sensor Test Minimum RPM] and [O2 Sensor Test Minimum TPS] to 255.

[Airbox Pressure Configuration] was set to 196 (11000100)

[1] An MPX4115AP would give better resolution. The MPX4250AP reads from 20 to 250 kPa and the MPX4115AP reads 15 to 115 kPa as indicated in the part number. The MPX4250AP was used due to availability.

[Barometric Pressure Key-On Maximum Value] and [Barometric Pressure Key-On Minimum Value] were set to 100 to fix the baro pressure to 100 (this is used for comparison with airbox pressure).

Table 11 shows the MPX4250 output as taken from the component datasheet.

Table 11 MPX4250 - output according to datasheet

Volts	ADC	kPa
1.192	61	70
1.388	71	80
1.582	81	90
1.777	91	100
1.973	101	110

[Airbox Pressure Sensor Data] was set up as shown in Table 12 for the ADC count/kPA table for the MPX4250.

Table 12 [Airbox Pressure Sensor Data]

ADC count	kPa
62	70
72	80
82	90
92	100
102	110

[Baro Correction] was set up set up as shown in Table 13 for the baro pressure/baro corr% table. For the position of the sensor, under the seat, this table needs to be set up like this so the fixed value of barometric pressure does not apply a correction.

Table 13 [Baro Correction]

Baro Pressure	Correction (%)
70	70
80	80
90	90
100	100
110	110

[Airbox Pressure Correction] was set up as shown in Table 14 to set up the (airbox pressure % of baro)/(corr air box pressure %) table, which in this implementation can be simplified to Baro kPA/correction%. The values assume a 3% reduction in fuel per 5 kPa.

Table 14 [Airbox Pressure Correction]

ABP/Baro (%)	Correction (%)
68	100 (sensor failure)
70	82
85	91
90	94
95	97
100	100
105	103
107	100 (sensor failure)

The ECM operation can be seen by logging data, the applied correction is logged on unknown61 and the sensor output ADC is logged on unknown63.

8.2.3 Tuning method

Two bosses were welded onto the exhaust, just upstream of the collector. A Tech Edge wideband sensor was used in one boss at a time for logging, as shown in Figure 35 and Figure 36.

Figure 35 Single Wideband Lambda Sensor fitted (1)

Figure 36 Single Wideband Lambda Sensor fitted (2)

The Tech Edge output was routed to the ECM O2 input and logged.[2]

The engine was operated at fixed throttle conditions for each of the lines in the fuel table and Mega Log Viewer was used to create a new fuel table to the targets shown in Figure 37.

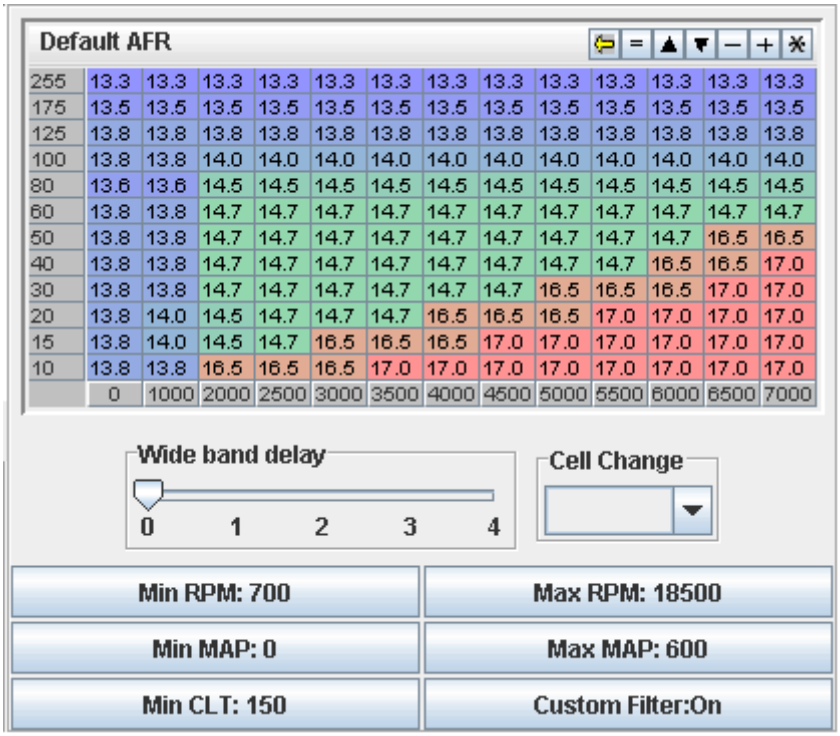


Figure 37 AFR targets used for project.

[2] Experience with the LC-1 suggests that the output is increased by 0.5V when connected to the ECM O2 sensor channel, possibly due to its high output impedance. The Tech Edge does not appear to have this issue.

9 References

1. Gasoline Engine Management, Robert Bosch GmbH, 2nd edition, 2004
2. Bosch Automotive Handbook, Robert Bosch GmbH, 6th edition, 2004
3. Four Stroke Performance Tuning, A Graham Bell, 1993

10 Appendix A – The Data Link connector

10.1 Location

For connecting your PC, or other tuning system, to the ECM, the Data Link Connector can be found:

XB R *under LH side lower fairing spar*

XB S/SS/SX/STT *Under seat to right of the ECM*

XB X/XT *LH opening of the seat subframe (no need to remove the seat - although it is easier to do so)*

X1/S3 *RH side of the headstock up to MY 2000. Under the seat, LH subframe rail on MY 2001*

10.2 Plug type

The Buell Data Link socket is a 4 pin Deutsch, part number DT04-4P.

To interface with the Data Link socket, the following parts are required:

No off	Deutsch part number	Description
1	DT06-4S	4 Pin Plug for female contacts
1	W4S	Secondary Lock
4	0460-202-16141	Solid Pin - 16-18 AWG

10.3 Pin outs

The Buell ECM communicates through the Data Link socket by TTL level RS232. This means 0 to 5V rather than the RS232 level of 0 to 12V. Connecting an RS232 device to the ECM is most likely to damage the ECM and hence should be avoided.

To step down the level, there are two options, firstly to buy an integrated lead, the second is to use a circuit using a Texas Instruments MAX232 chip.

Palm E2 and Tx both use TTL level RS232 and hence require no auxiliary circuit.

The following pin numbers are applicable to the Buell Data Link socket:

Buell socket Pin number	Purpose
1	ECM receive (TTL level RS232)
2	Ground
3	ECM transmit (TTL level RS232)
4	12V

Note that ECM receive connects to device (Palm / PC etc.) transmit and vice versa.

11 Appendix B - How To …

11.1 How to perform a TPS reset

(This chapter applies for models with DDFI-2 injections only. Models from 2008 and later are usually equipped with DDFI-3 and do not require a TPS reset done by a computer any more.)

On the front left of the engine, between the airscoop and the engine, is the idle adjust screw, which simply adjusts the butterfly in the injector to allow air through for tickover.

- Connect the bike with the computer
- Turn ignition on and set kill switch to the run position
- Turn out this screw until the throttle voltage doesn't decrease any more
- Keep winding the screw two additional turns
- Close the throttle with light clockwise pressure on the throttle grip. The butterfly is fully closed if it sticks inside the manifold. *It's essential, that this is done whith care, as the TPS reset needs to be done with the butterfly fully closed!*
- Click the "Reset TPS ..." button to perform TPS calibration
- Turn idle adjustment cable clockwise until TPS degrees read 5.2 - 5.6 degrees. This setting is just to make the engine start and needs to be adjusted to correct idle speed with a warm engine afterwards.
- Run vehicle until engine temperature is at least 140 °C or 285 °F
- Set idle speed to 1050-1150 min^{-1}

DDFI-3

- Turn ignition on and set kill switch to the run position
- For three cycles: Pause one second on each throttle stop (fully open, completely closed)

11.2 How to check static timing

This is done by slowly rotating the engine, whilst watching the Cam Position Sensor on the Diagnostics page.

- Raise the back wheel off the floor
- Remove timing inspection plug
- Put bike into 5th gear to ease fine turning of the engine
- Raise side stand
- Select Diagnostics page in ECMSpy or similar and connect to the ECM.
- Turn back wheel forward slowly, until the timing mark appears at the left of the inspection hole
- The CPS value should be 0 or 5, depending on which cylinder is due to fire next. If it is on 0, go to next step, if on 5, rotate engine one more full revolution, then follow the next step.
- Rotate the wheel very slowly until the CPS value in ECMSpy or similar increases to 5 and the fuel pump starts running. This is the exact point of firing.

Now check the timing mark inside the inspection hole. If it is exactly central all is good, if to the left, then the timing is advanced, if to the right of the hole, it is retarded. If the timing is not correct, follow the instructions in your service manual to correct.

12 Appendix C - The use of MegaLogViewer

12.1 Introduction

MegaLogViewer is some excellent software written by Phil Tobin to help analyse logfiles from MegaSquirt fuel injection and to assist in creating optimized fuel maps.

MegaLogViewer is a perfect tool for applying the EGO factor to fuel maps by using logged data and the fuel maps used by the ECM during the logging. It also allows logs to be scrutinised, as shown in

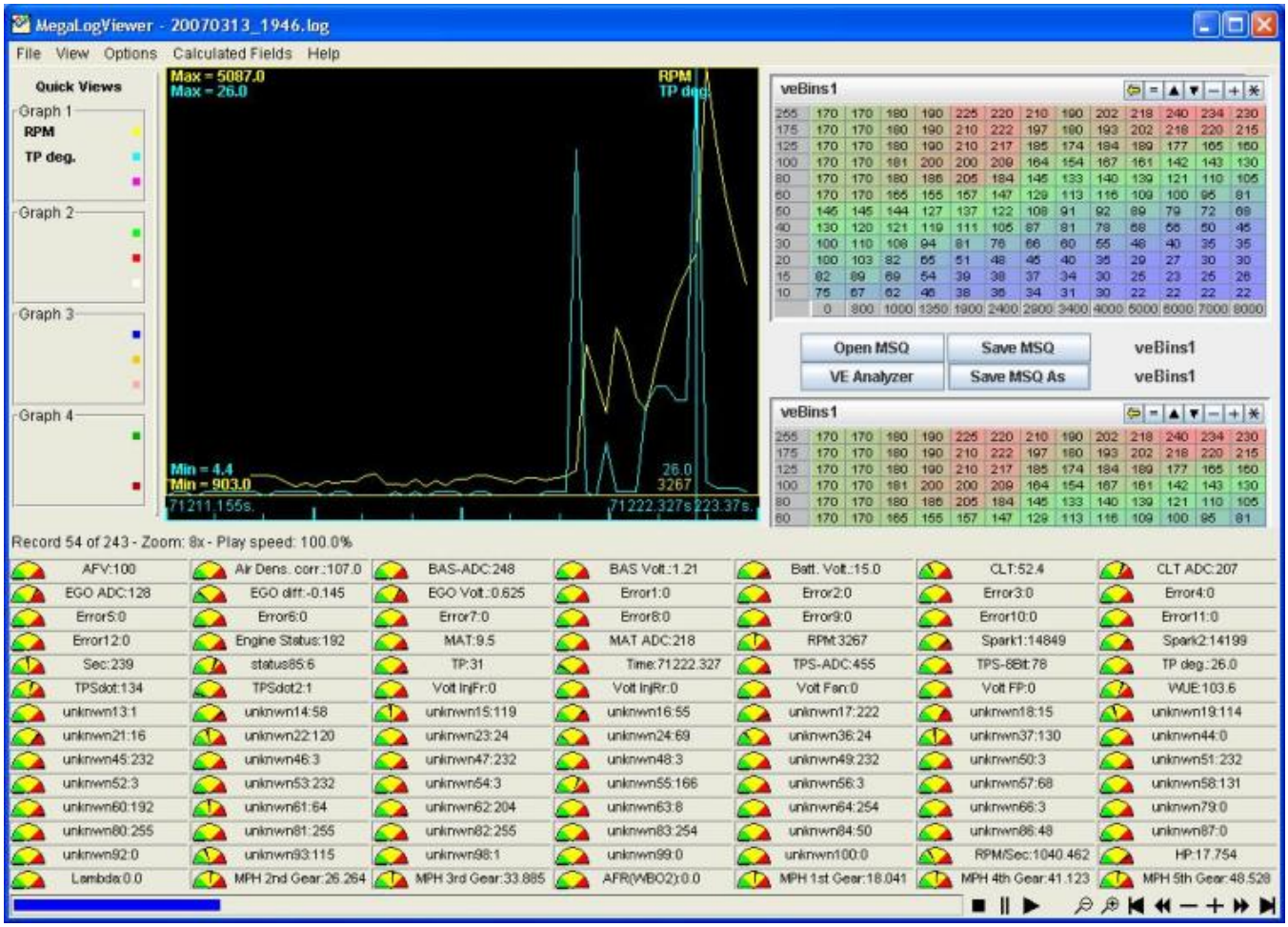


Figure 38 MegaLogView screenshot

MegaLogViewer allows corrections to be made to the map from the lambda sensor voltage and/or the EGO correction. Correcting the map by both methods is double accounting as the ECM has already used the lambda sensor voltage to create the EGO correction. Using both has been shown to result in maps that do not converge, i.e. repeating the map correction process with subsequent logs results in notable changes to the maps. Using the EGO shows a reduction of changes the more logs and operations are carried out.

12.2 Log pre-requisites

The important parameters needed in the log to work with MegaLogViewer are:

i. Time

ii. RPM

iii. TPS 8Bit - the throttle position from 0 to 255 (WOT)

iv. CLT - Cylinder heat temp

v. EGO correction

When the data has been logged, it is a good idea to sort through it in a tool such as Excel to ensure that it does not have the odd corrupt parameter. Logging using the Palm E2 has been shown to result in some corruption, possibly due to the transmission of data at TTL level.

If you do have Excel, open the file, highlight the row with all the titles, RPM, O2 etc. then do Data->Filter->Auto Filter, then for each of the important columns click on the down arrow, and then select the numbers which look wrong and then delete.

TPS should go from 0 to 255, RPM 0 to 8000, EGO 70 to 130 etc...

After checking, if you save the data, be sure to save it as 'tab delimited' rather than an Excel workbook.

12.3 Properties file

To ensure that MLV picks up the important parameters from your log, you need to check the following are in the .properties file:

TP=TPS 8Bit

egoCorrection=Gego

RPM=RPM

Time=Time

coolantTemp=CLT

Where a wideband sensor is used and it is logged on the same timebase as the ECM data, you can set:

O2volts=O2

and configure the AFR calc from the menus in MegaLogViewer.

12.4 Running the analysis

Load the logfile

To load the fuel map, use the button [Open MSQ].

When opened, you can select which table will be modified by the VE Analyzer by pressing the top right rectangle to the right of the four buttons between the tables. veBins1 is the front fuel map, veBins2 is the rear, afrBins1 is the target AFR table.

Before pressing [VE Analyzer], we have to make sure MLV is set up to read our maps correctly.

Select [TPS 8Bit] from Options->Y Axis.

When you click [VE Analyzer], your fuel map will appear in a window to the left, and a target AFR map to the right, as shown in Figure 39.

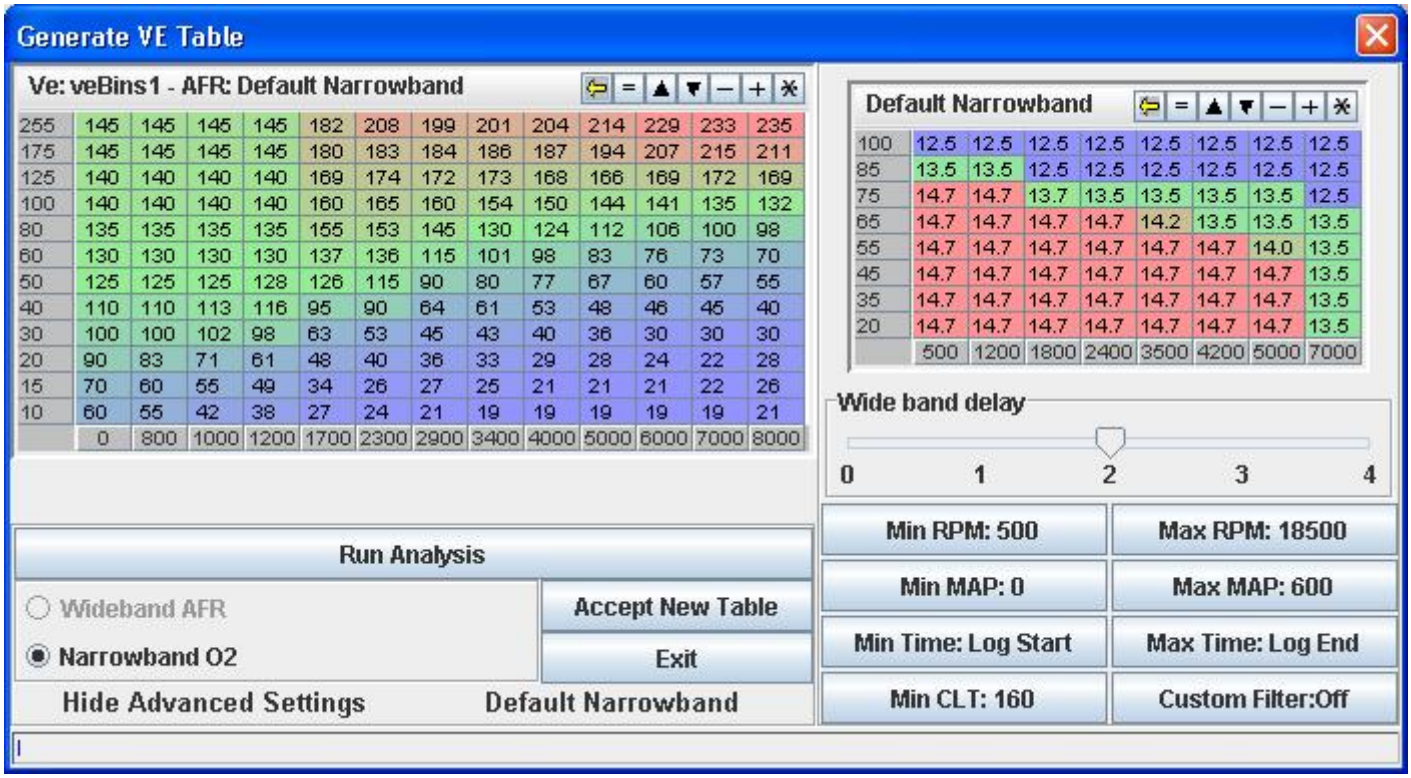


Figure 39 VE Analysis Window

If you cannot see two tables, click on the [Advanced Settings] button at the bottom left. Also at the bottom in the left half is the button to select the target AFR map, click on it and select afrBins1. The table will be displayed to the right.

Note that if you have set the msq file up successfully, the whole table will be set to 14.7. Is this what you want? After all, max power is made with about 10% more fuel than that... Note that you can only tune to a value other than 14.7 if you have a WB sensor.

On the subject of sensors, select if you have a NB or WB (if you have a NB and you cannot select it, you can be sure you have erroneous numbers in your O2 column in your logfile - anything over 2V and MLV thinks it is WB). If you have a WB, you will need to select the type in Calculated Fields->Wideband O2-AFR. As the Buell cannot read in much more than 1 Volt from the lambda sensor, we will probably have to select [Custom Linear] and define the points on the line.

When we are ready to correct the fuel table to give the AFR we have selected, press [Run Analysis].

MLV will work through the logged data and correct the fuel table based on:

For NB - The correction calculated by the ECM (EGO)

For WB - The ratio of the target AFR to the measured AFR

MLV is clever in the way it applies the correction, there is a good explanation on the MLV website.

When the analysis is finished, a window will pop up giving the stats of the analysis, as shown in Figure 40, the maximum change in the fuel table is the one you are interested in, if it is very large, like more than 30 you need to know why.

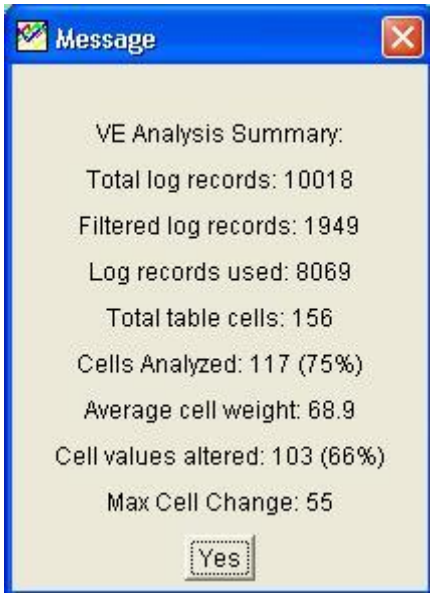


Figure 40 VE Analysis Summary Window

Clear that window and have a look at your data; the sections of your fuel table which have changed will be displayed in red, if you hover the mouse pointer over each number you will see the original value and how many logged data points have been used to calculate the new value.

13 Appendix D - Air Fuel Ratio and Lambda

The mixture strength is commonly referred to as AFR or Lambda, where:

$$AFR = {W_{air}}/{W_{fuel}}$$

Where W_{air} is the mass of air being inducted into the cylinder every cycle

W_{fuel} is the mass of fuel being delivered to the cylinder

$$\lambda = {AFR_{actual}}/{AFR_{stoichiometric}}$$

Where AFR_{actual} is the actual AFR in the cylinder

$AFR_{stoichiometric}$ is the theoretical AFR where complete combustion occurs

14 Appendix E - Narrow Band and Wide Band Lambda sensors

14.1 Narrow band sensors

Narrow band lambda sensors are used as a “switch” to ensure the correct mixture is metered for maximum catalytic converter efficiency. The sensor measures the residual oxygen after fully reacting the exhaust gas, i.e. if the mixture is unburned, the sensor will do it’s best to “burn” it and then measure the residual oxygen.

Regardless of what you are told, the operation of the sensor does not lend itself to measurement of any AFR other than stoichiometric.

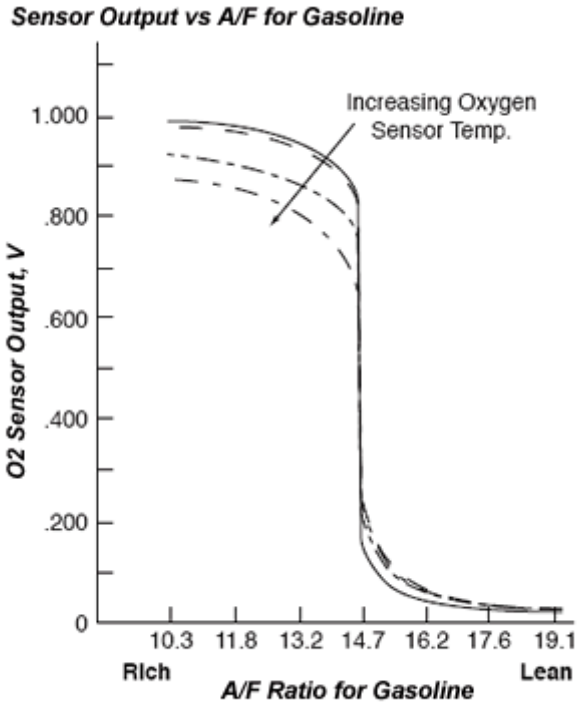


Figure 41 Voltage output as a function of AFR with change in temperature (Nernst equation theory)

With this in mind, a narrow band sensor can only be used to tune to a lambda of 1 (14.7:1 for gasoline fuelled engines).

This is the type of sensor the ECM uses for Closed Loop and Closed Loop Learn operation, as well as the calculation of the AFV and any corrections needed for Open Loop Learn.

14.2 Wide band sensors

Wide band sensors are more expensive than narrow band sensors and work in a similar manner, however instead of just measuring the residual oxygen, they operate a “pump” to either add or remove oxygen from the measuring cell to measure a stoichiometric mixture. In doing this, the sensor knows how much oxygen is being added or removed by the current drawn by the “pump”.

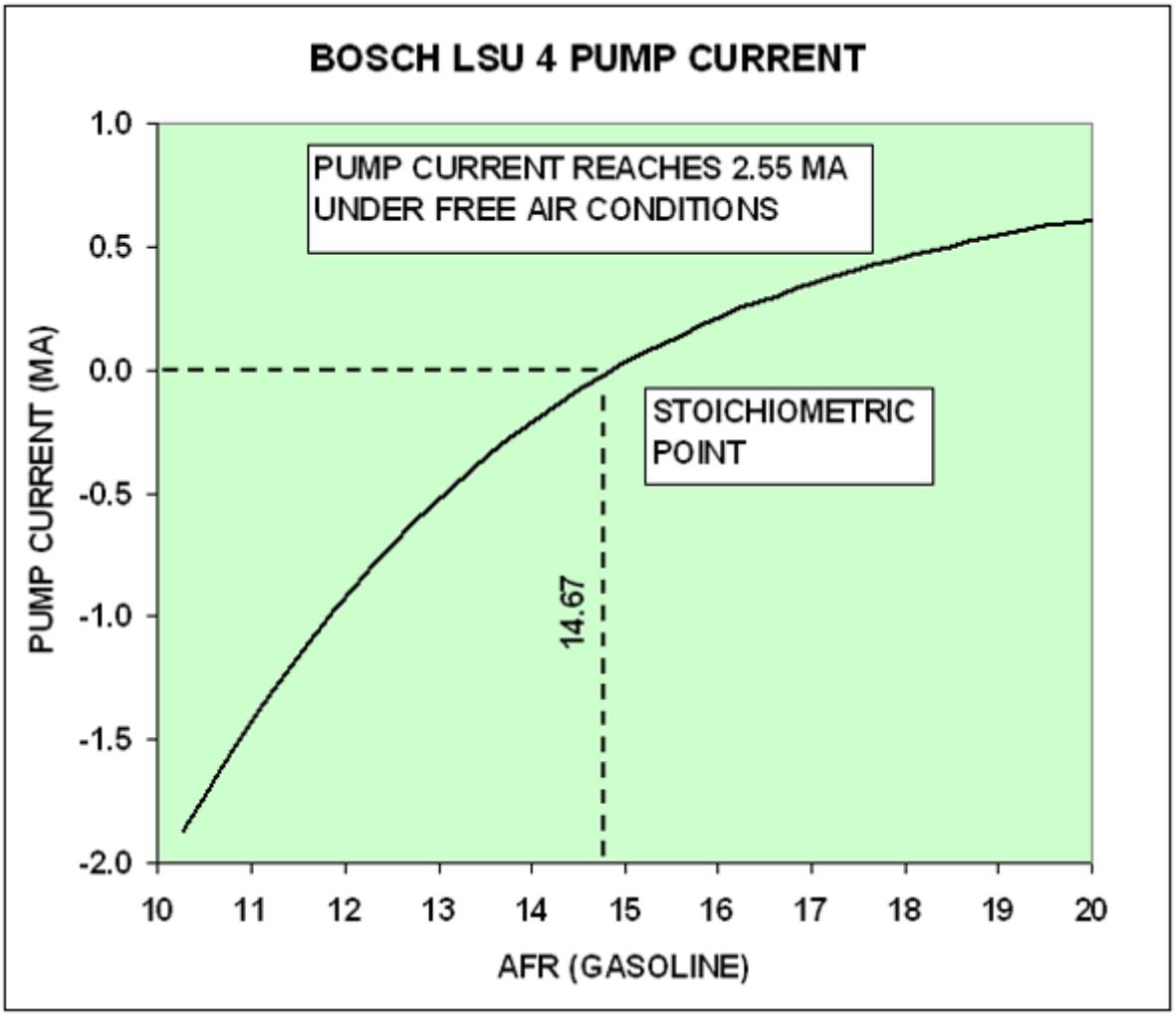


Figure 42 Pump current as a function of AFR

As a final note, evidence shows that the ECM reads the O2 sensor at 90° after TDC in the expansion stroke and then the variable isn't touched for 2 crankshaft revolutions.

15 Appendix F - Air Fuel Ratio Targets

The amount of fuel required is dependent on the mass of air available in the combustion chamber and the operating regime of the engine.

For max power, you generally need an AFR[3] 10% richer than stoichiometric

For max efficiency, you generally need an AFR stoichiometric or leaner

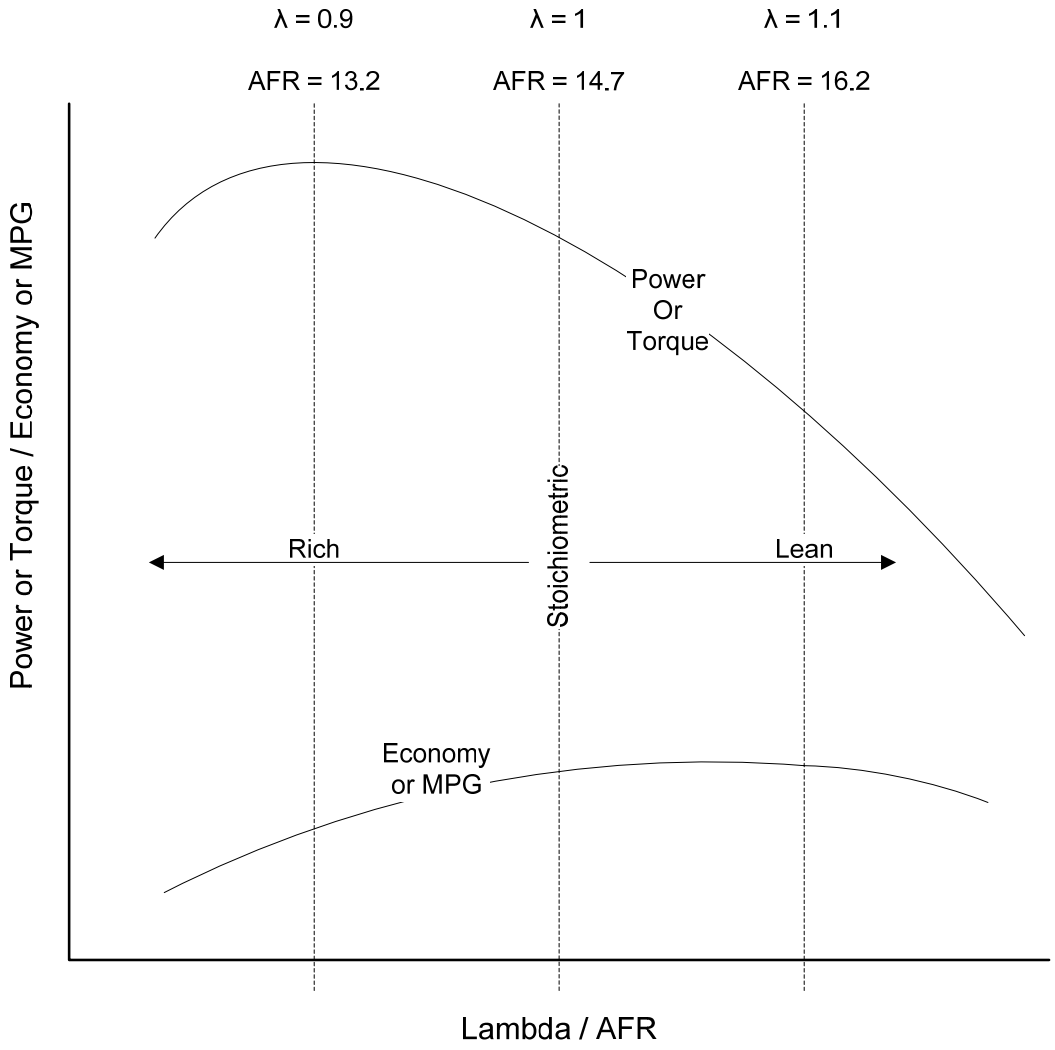


Figure 43 Power and Efficiency as a function of AFR

Basically, a mixture of lambda 0.9 can use all the air (but with some fuel left over) and a mixture of lambda 1.1 can burn all the fuel (but with some air left over).

MPG or efficiency decreases as lambda increases past 1.1 as the potential for misfire (cycle by cycle variation) increases.

Catalytic converters like to operate at Lambda 1.0. For further reading, see reference 2.

[3] See section 13

For the Buell DDFI and DDFI-2, there is one lambda sensor in the rear cylinder. When the engine runs in closed loop, the mixture is controlled to lambda 1.0, which is a compromise for both fuel consumption and power. The closed loop area is at part throttle, so you are not interested in power, however you are interested in smoothness (no or very few misfires) and you may also be interested in fuel consumption if you stay at a constant throttle opening for long periods, such as motorway operation. Since the rear will always be controlled to lambda 1.0, the front can be made to run richer to reduce misfire, or leaner to reduce fuel consumption.

16 Appendix G - How were the maps set up at the factory?

We can all guess, and here is my guess, but first let me present my evidence:

There exist two open loop corrections, one for open loop and one for WOT, if you look at what these values are, you will see 105% and 110% respectively.

Since we have discussed that max power is made approximately 10% richer than stoichiometric, this suggests that the whole map is set to stoichiometric[4].

So an educated guess is that a front narrowband lambda sensor was used in conjunction with the rear, the [Open Loop Default Correction] and [WOT Enrichment] corrections were set to 100% and the mixture was adjusted to give stoichiometric throughout the maps for front and rear.

[4] I am deliberately forgetting about closed throttle operation, i.e. the Open Loop operation below the closed loop polygon

17 Appendix H - Engine speed limiting in response to engine temp

[Temperature Soft Limit Minimum Load]	TP above which soft temp limit enabled typical value 80
[Temperature Soft Limit Minimum RPM]	RPM above which soft temp limit enabled typical value 3500rpm
[Temperature Hard Limit Minimum Load]	TP above which hard temp limit enabled typical value 255
[Temperature Hard Limit Minimum RPM]	RPM above which hard temp limit enabledtypical value 4500rpm
[Temperature Soft Limit Trigger]	Soft temp limit, high, °C typical value 280
[Temperature Soft Limit Recharge]	Soft temp limit, low, °C typical value 275
[Temperature Hard Limit Trigger]	Hard temp limit, high, °C typical value 290
[Temperature Hard Limit Recharge]	Hard temp limit, low, °C typical value 285
[Ignore Minimum RPM Trigger]	Temp, high, where soft TP/RPM limits ignored typical value 305
[Ignore Minimum RPM Recharge]	Temp, low, where soft TP/RPM limits ignored typical value 304
[Temperature Kill Limit Trigger]	Kill temp limit, high, °C typical value 305
[Temperature Kill Limit Recharge]	Kill temp limit, low, °C typical value 304
[Temperature Limit Engine Lamp On Value]	Start flashing CEL, °C typical value 280
[Temperature Limit Engine Lamp Off Value]	Stop flashing CEL, °C typical value 275

18 Appendix I - Calculation of EGO

Given the assumption, that O2 is fluctuating somehow between a high and a low voltage. First condition is, if the low and the high value are both higher/lower than the target voltage (no transition occurs) or not (transition occurs).

If no transition occurs, the current EGO correction is decreased/increased by 0.3 or 0.5 (this is the I-value), depending on the state (high load, low load, idle).

If a transition occurs, the current EGO correction is decreased/increased by 1.0 (this is the P-Value).

Aside from the transition/no transition constraint, the change in EGO correction seems completely independent from the actual EGO voltage, so it doesn't make any difference, if O2 voltage is floating between 420 and 480 mV or 0 and 480 mV, EGO correction will be increased by 0.3 in every cycle.

And, interestingly:

> **megamanual wrote:**
>
> The following lines set the actual correction factor.
>
> **Code:**

```
If egocount > egocountcmp  /* Check if exceeded lag time */
Then
   egocount = 0

   If ego > 26          /* (counts, or 0.5 Volts) then (rich) */
   Then
      tmp = egocurr - egodelta
      if tmp < egolimit then goto VETABLELOOKUP
      egocorr = tmp
      goto VETABLELOOKUP

   Else                 /* else (lean) */
       tmp = egocorr + egodelta
       if tmp > egolimit then goto VETABLELOOKUP
       egocorr = tmp
       goto VETABLELOOKUP
   End if
End if
```

This looks surprisingly similar to the way the ECM calculates egoCorr, except that the ECM's egodelta is varied against O2 voltage diff.

19 Appendix J - Pressure measurement and compensation

The Buell ECM includes a function for the correction of fuelling for changes in pressure.

The function is configurable in that it can be used to apply a correction for atmospheric pressure only or for airbox pressure, i.e. correction for intake ram. As the XBs do not use this function, there is no pressure measurement device installed at the factory.

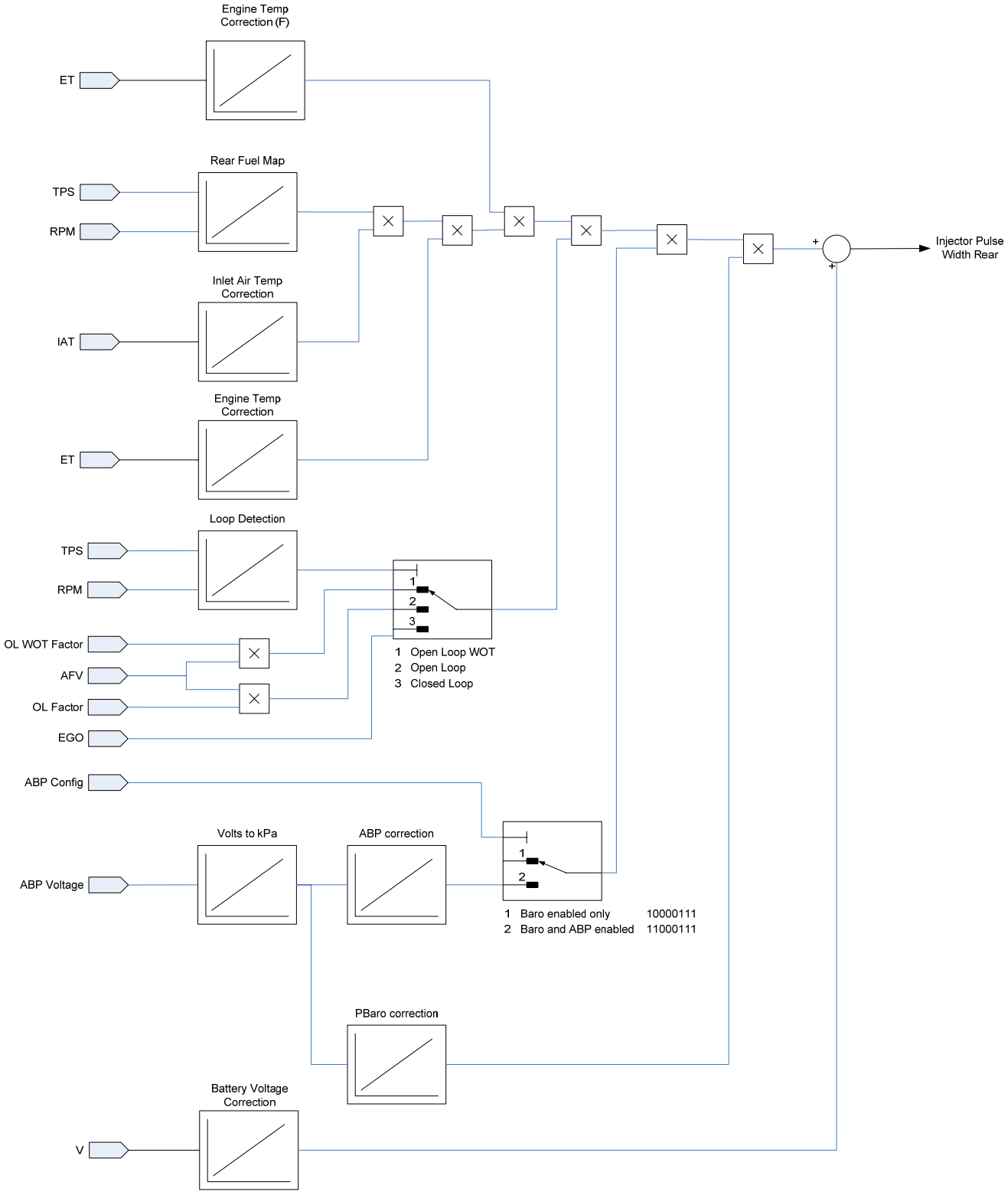


Figure 44 Front cylinder fuel metering with pressure compensation

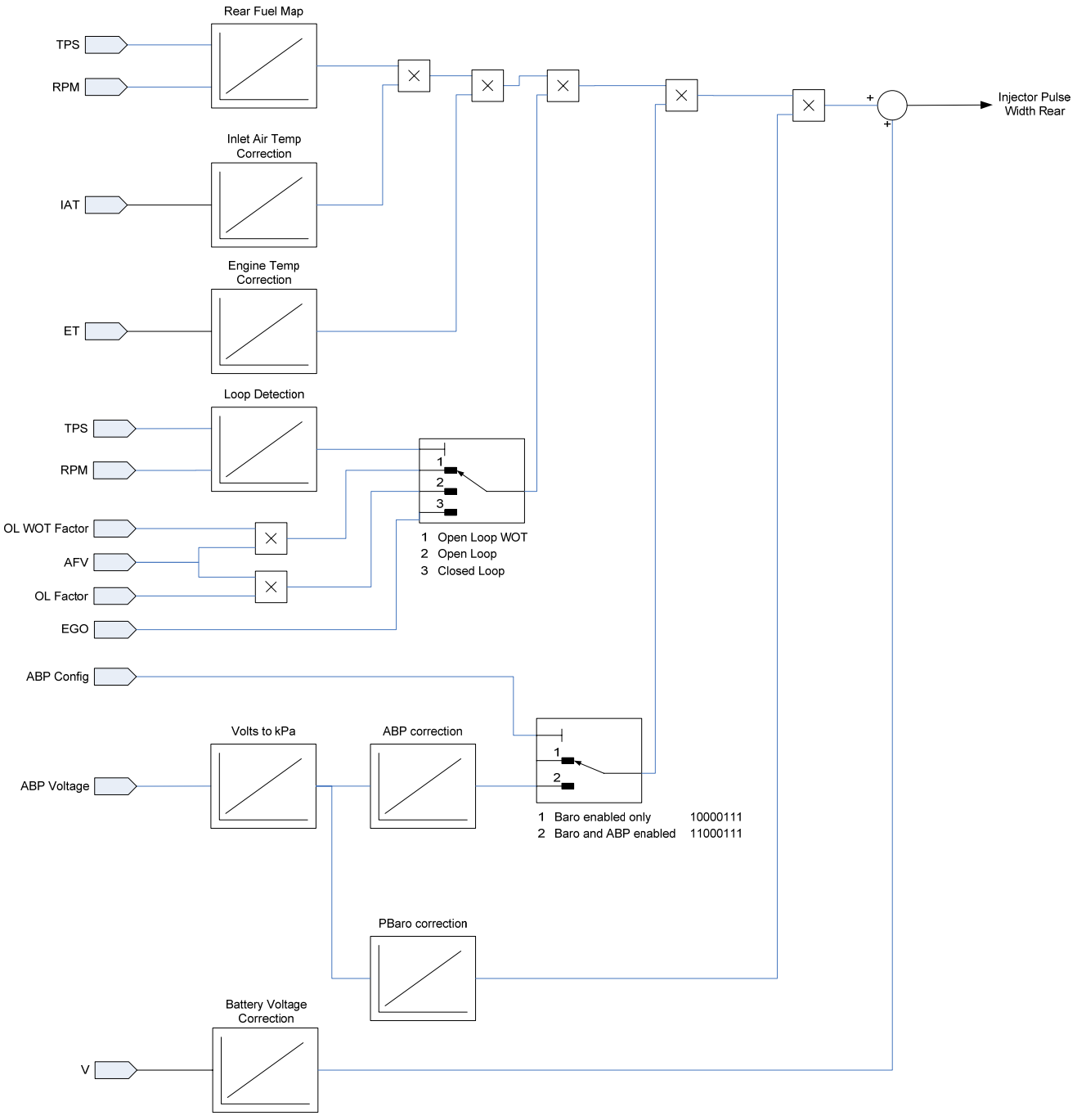
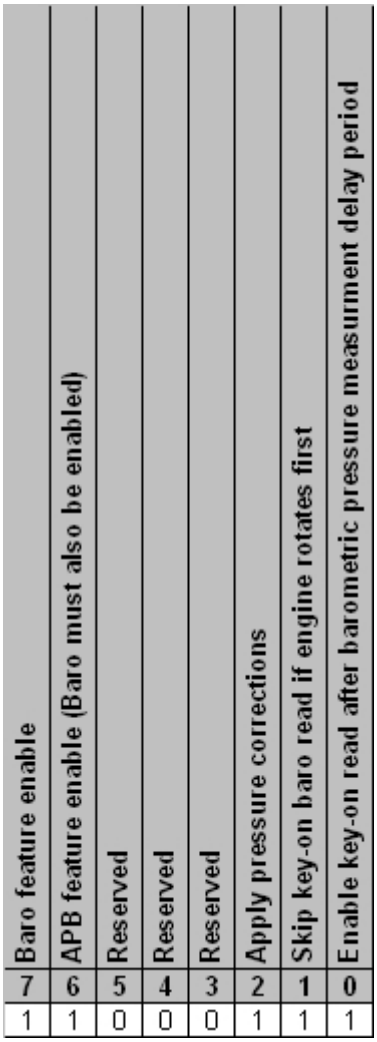


Figure 45 Rear cylinder fuel metering with pressure compensation

The logic behind fuel metering with pressure compensation is shown in Figure 44 and Figure 45. The function is configured using byte [Airbox Pressure Configuration], see section 18.



Baro feature enable	APB feature enable (Baro must also be enabled)	Reserved	Reserved	Reserved	Apply pressure corrections	Skip key-on baro read if engine rotates first	Enable key-on read after barometric pressure measurment delay period
7	6	5	4	3	2	1	0
1	1	0	0	0	1	1	1

Figure 46 Airbox Pressure Configuration

When the engine is turned on at the key, and following a delay, [Baro Pressure Sensor Delay], the ECM reads the barometric pressure and, if between the max and min allowable values, [Barometric Pressure Key-On Maximum Value] and [Barometric Pressure Key-On Minimum Value], stores this in its memory. An overall fuel map correction is determined from the [Baro Correction] look up table.

Table 15 [Baro Correction] look up table example values

Baro Pressure	Correction (%)
70	69
80	79
90	89
100	99
110	109

The ECM compares the barometric pressure (assumed not to change for this engine run) to the real-time Air Box Pressure reading. The Air Box Pressure reading is triggered by the rising and falling edges of the Cam Position Sensor and therefore the measurements are always made at the same cam (and crank) position.

The ratio Airbox Pressure / Barometric Pressure is used to determine a correction from the [Airbox Pressure Compensation] look up table. Whereas the correction for barometric pressure can be calculated from simple physics, the values in the [Airbox Pressure Compensation] look up table will be heavily dependant on the flow field around the sensor and hence the sensor position in the airbox.

Table 16 [Airbox Pressure Compensation] look up table example values

ABP/Baro (%)	Correction (%)P
68	100(sensor failure)
70	70
85	85
90	90
95	95
100	100
105	105
107	100(sensor failure)

[Airbox Pressure Sensor Data] calibrates the hardware, i.e. Voltage as a function of pressure

Table 17 [Airbox Pressure Sensor Data] look up table example values

ADC count	kPa
62	70
72	80
82	90
92	100
102	110

The ECM operation can be seen by logging data, on the BUEIB310, the applied correction is logged on offset 61 and the sensor output ADC is logged on offset 63.

19.1 Hardware required

As the XB was never built with pressure measurement sensor, if you want to use this function, one needs to be added to the system.

19.1.1 Connection to ECM

ECM pinouts for pressure sensing are shown in Table 18, these are only active when bit 7 of the [Airbox Pressure Configuration] byte is enabled.

Table 18 ECM pinouts for pressure sensing

ECM connector	ECM pin	Description as stock	Description with ABP enabled
Grey	1	5v Sensor Power	5v Sensor Power
Black	9	Active Muffler Feedback	Pressure Sensor Output Signal
N/A	N/A	Ground	Ground

19.1.2 Automotive sensors

Many automotive sensors are available, however it is important to have the calibration also. Many of these automotive sensors are based on the MPX4115 and MPX4250 series of sensors.

The 1125R and CR use a Bosch sensor, part number 0 261 230 061 (PN P0091.1AM). This is very expensive when bought through Buell and does not appear in Bosch catalogues (possibly as it is a part sold to Rotax). This sensor part number is also used in some Aprilias (PN AP0274055), which, although expensive new, makes sourcing a secondhand part somewhat easier. A sensor from the same series is used on some small Peugeots and Citroens, Bosch part number 0 261 230 043. These are assumed to be the same as part number 0 261 230 052 shown in the Bosch catalogue, with calibration data, which operates between 10kPa and 115kPa (as MPX4115).

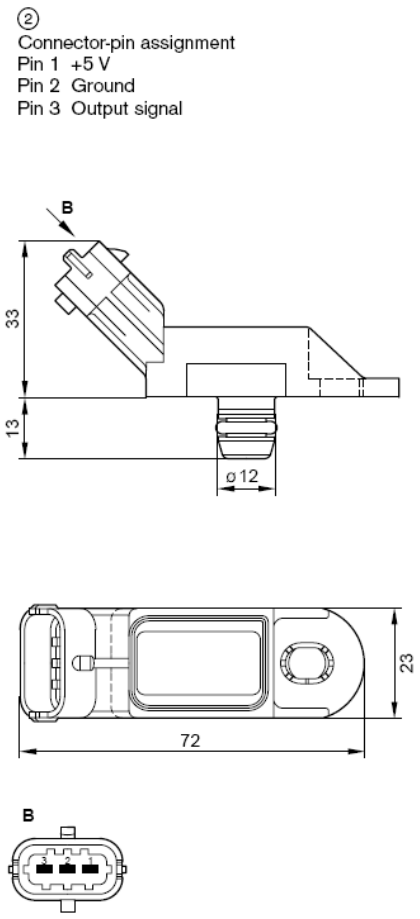


Figure 47 1125R/CR type pressure sensor dimensions and pinouts (Bosch 0 261 230 052)

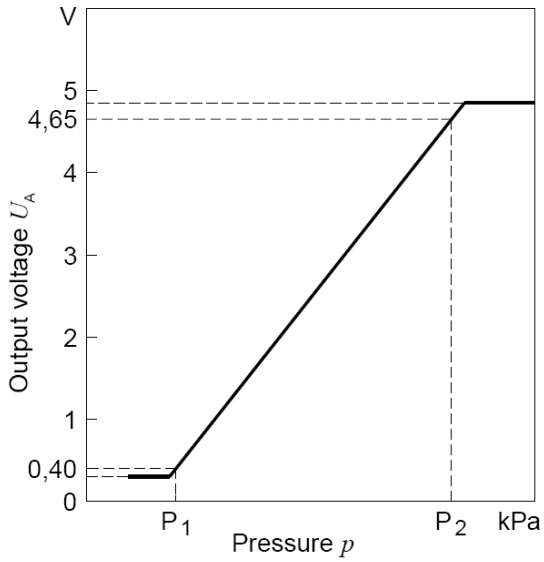


Figure 48 1125R/CR type pressure sensor response for 5V input (Bosch 0 261 230 052) where P1 is 10kPa and P2 is 115kPa

The required connector parts required are shown in Table 19.

Table 19 Connector for Bosch 0 261 230 061 / 52 / 43 pressure sensor (Bosch PN)

Quantity	Description	Bosch Part Number
1	Plug housing	1 928 403 966
3	Contact pin	1 928 498 060
3	Gasket	1 928 300 599

or

Table 20 Connector for Bosch 0 261 230 061 / 52 / 43 pressure sensor (Buell PN)

Quantity	Description	Buell Part Number
1	Connector	Y0055.1AM
3	Terminal	Y0086.1AM

The sensor family above is suitable for a normally aspirated engine for barometric pressure or (ram) forced induction corrections. For a turbo application, 115kPa will not allow sufficient range. A sensor such as the Bosch 0 261 230 042, which has an integral temperature sensor which can be connected to the IAT input, will be more applicable with a range up to 250kPa, allowing nearly 20psi of boost.

19.1.3 MPX series

The MPX series of sensors, made by Freescale, can be used directly and are supported by comprehensive data sheets.

Figure 49 shows the parts used for implementation of a pressure measurement system using an MPX series sensor. As this was to be connected to the 3 pin Deutsch connector under the seat, which on a stock 12 would be used for the AMC, a 7805 voltage regulator is used to power the device from a 12V input. A neater installation would be to use the 5V sensor power from the ECM, however this was not directly available at the Deutsch connector. Capacitors are used as directed by the data sheets for each component.

Not all the pins on the MPX4xxxAP are used, the redundant pins can be cut off as shown in Figure 50.

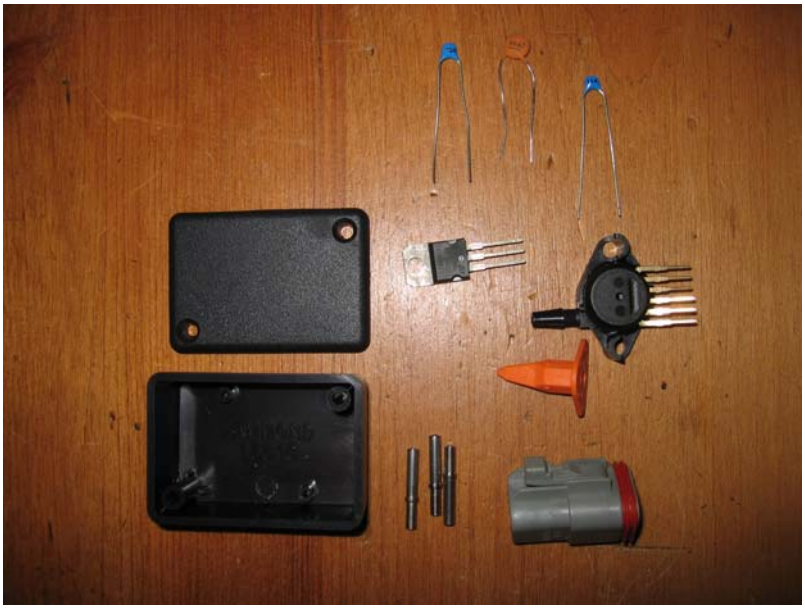


Figure 49 Parts needed for MPX4xxx pressure measurement

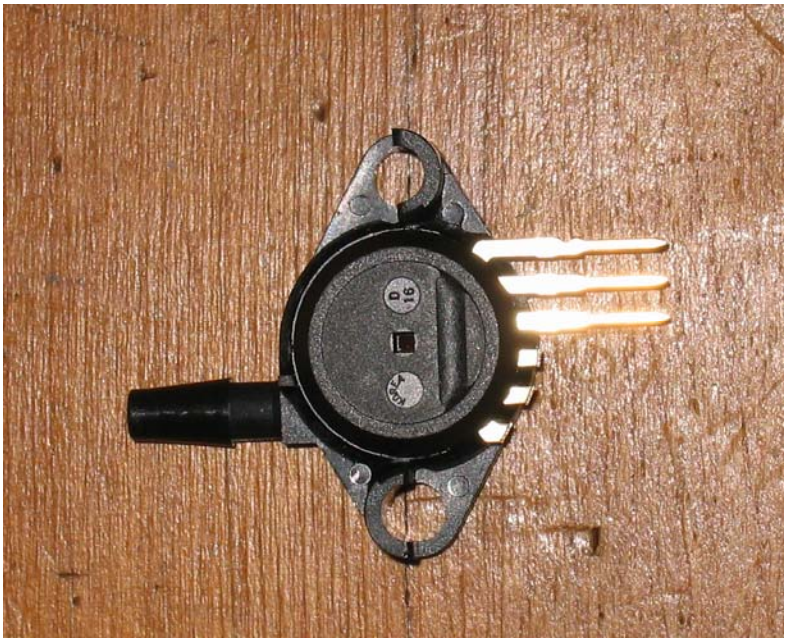


Figure 50 MPX4xxxAP with redundant pins removed

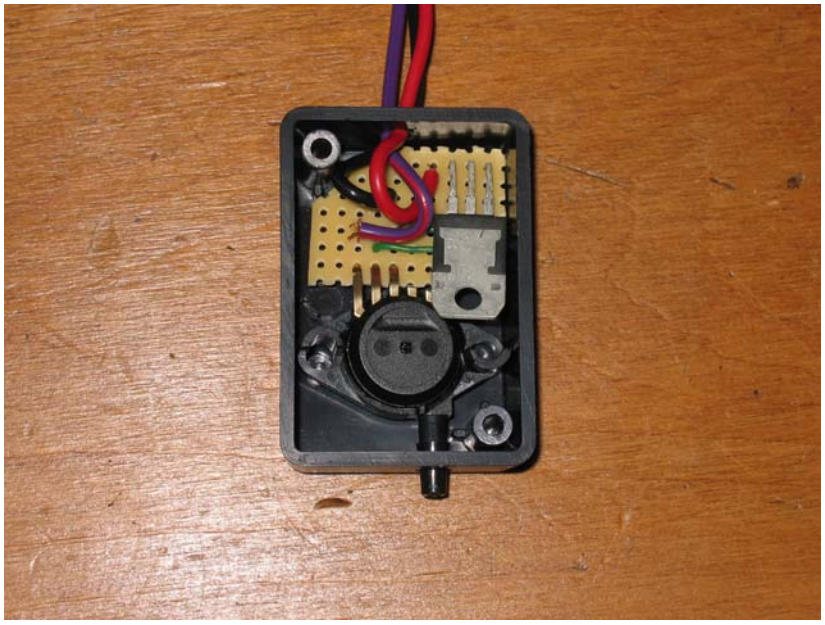


Figure 51 MPX4xxxAP Pressure measurement system when assembled

When assembled in a box, see Figure 51, the next question is where to put it. One option is to mount it in the airbox as shown in Figure 52.

Figure 52 Pressure measurement system installed in the airbox

Other options are to mount it outside the airbox, either measuring atmospheric (or barometric) pressure or connected by a pipe either upstream or downstream of the air filter.

Regardless of where it is mounted, the system will need some thought when setting up the look-up tables discussed previously.

The MPX4250 will be more useful for a turbo application.

20 Appendix K – EEPROM Directory

20.1 BUEJAxxx / BUEKAxxx

BUEJAxxx / BUEKAxxx					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Stored Error Byte 1	0x1	1	Bits	1	Stored (historic) trouble codes, byte 1
Stored Error Byte 2	0x2	2	Bits	1	Stored (historic) trouble codes, byte 2
Stored Error Byte 3	0x3	3	Bits	1	Stored (historic) trouble codes, byte 3
Number of Rides since Error Set	0x4	4	Value	1	Number of rides since a trouble code was set
Calibration ID	0x5	5	Value	1	Country specific calibration identifier
AFV Rear	0x6	6	Value	2	Adaptive fuel value rear cylinder
System Configuration	0x8	8	Bits	1	Global ECM setup
Engine Running Minimum RPM	0xe	14	Value	2	Minimum RPM indicating a running engine (cranking otherwise)
Throttle Position Sensor Reset Voltage	0x12	18	Value	2	TPS voltage with a fully closde throttle, written on a TPS reset
Throttle Position Sensor Voltage Range	0x14	20	Value	2	TPS voltage difference from fully closed to WOT
Throttle Position Sensor Degrees Range	0x16	22	Value	2	TPS degrees difference from fully closed to WOT
Throttle Position Sensor Moving Average Fraction	0x18	24	Value	1	TPS fraction used to detect TP changes
O2 Sensor Target Voltage	0x19	25	Value	1	O2 sensor target voltage
O2 Sensor Rich Voltage	0x1a	26	Value	1	O2 sensor voltage indicating a rich mixture
O2 Sensor Lean Voltage	0x1b	27	Value	1	O2 sensor voltage indicating a lean mixture
Closed Loop Feature Minimum RPM	0x1c	28	Value	1	Minimum RPM to activate O2 sensor
Closed Loop Feature Minimum Throttle	0x1d	29	Value	1	Minimum throttle to activate O2 sensor
O2 Sensor Activation Time	0x1e	30	Value	1	O2 sensor activation delay
O2 Sensor Deactivation Time	0x1f	31	Value	1	O2 sensor deactivation delay
Startup Fuel Pulsewidth	0x20	32	Table	6	Starting fuel pulse length
Fuel Pump Duty Cycle Table	0x26	38	Table	6	Fuel pump duty cycle table
Fuel Pump Frequency	0x2c	44	Value	1	Fuel pump PWM frequency
Light Acceleration Condition	0x2d	45	Value	1	TPS change indicating a light accel. condition
Full Acceleration Condition	0x2e	46	Value	1	Change in throttle movement indicationg a full acceleration condition
Acceleration Enrichment Duration	0x2f	47	Value	1	Full acceleration enrichment duration in engine revs
Acceleration Enrichment	0x30	48	Table	8	Acceleration enrichment
Deceleration Correction Region	0x38	56	Table	8	Deceleration correction region
Deceleration Correction	0x40	64	Value	1	Deceleration correction
Deceleration Condition Hysteresis	0x41	65	Value	1	Deceleration condition throttle hysteresis
Fuel Cut Region	0x42	66	Table	4	Fuel cut region
WOT Region	0x46	70	Table	4	Wide-Open Throttle definition
WOT Enrichment	0x4a	74	Value	2	Default fuel correction, applied to WOT regions
Idle Correction	0x4c	76	Table	8	Idle correction
Idle Maxiumum Engine Speed	0x54	84	Value	2	Idle region maximum RPM
Idle Maxiumum Load	0x56	86	Value	1	Idle region maximum throttle
Startup Enrichment Temperature Axis	0x58	88	Axis	4	Startup condition temperature axis
Startup Enrichment	0x5c	92	Table	4	Fuell correction after egine startup
Startup Enrichment Duration	0x60	96	Table	4	Duration of startup fuel enrichment
Open Loop Default Correction	0x64	100	Value	2	Default fuel correction, applied to open loop regions
Front Cylinder Correction	0x66	102	Table	16	Front cylinder fuel enrichment on engine temperature
Warmup Enrichment	0x76	118	Table	28	Engine Temp fuel correction

BUEJAxxx / BUEKAxxx					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Hot Start Condition	0x92	146	Value	2	Engine temperature indicating a hot start condition
Engine Temperature Sensor Conversion Data	0x94	148	Table	28	Engine temperature senor data
Air Temperature Correction	0xb0	176	Table	28	Air Temp correction
Air Temperature Sensor Data	0xcc	204	Table	28	Air temperature sensor data
Battery Voltage Correction	0xe8	232	Table	24	Battery voltage correction
Closed Loop Region Upper Boundary	0x100	256	Table	8	Closed loop upper boundary
Closed Loop Region Lower Boundary	0x108	264	Table	18	Closed loop lower boundary
Closed Loop Upper Boundary Load Hysteresis	0x11a	282	Value	1	Closed loop upper boundary throttle hysteresis
Closed Loop Lower Boundary Load Hysteresis	0x11b	283	Value	1	Closed loop lower boundary throttle hysteresis
Closed Loop Upper Boundary RPM Hysteresis	0x11c	284	Value	2	Closed loop upper boundary RPM hysteresis
Closed Loop Lower Boundary RPM Hysteresis	0x11e	286	Value	2	Closed loop lower boundary RPM hysteresis
EGO Correction Maximum Value	0x120	288	Value	2	Maximum closed loop EGO correction
EGO Correction Minimum Value	0x122	290	Value	2	Minimum closed loop EGO correction
Open Loop Enrichment Delay	0x124	292	Value	1	Time before increasing AFV
AFV Storage Delay	0x125	293	Value	1	Time between AFV writes to EEPROM
AFV Maximum Value	0x126	294	Value	2	Maximum allowed AFV
AFV Minimum Value	0x128	296	Value	2	Minimum allowed AFV
AFV Increase Factor	0x12a	298	Value	2	Factor applied to increase AFV
AFV Decrease Factor	0x12c	300	Value	2	Factor applied to decrease AFV
Calibration Mode Maximum Engine Temperature	0x12e	302	Value	2	Maximum engine temperature to enable calibration mode
Calibration Mode Minimum Engine Temperature	0x130	304	Value	2	Minimum engine temperature to enable calibration mode
Calibration Mode Region Upper Boundary	0x132	306	Table	8	Calibration mode region upper boundary
Calibration Mode Region Lower Boundary	0x13a	314	Table	14	Calibration mode region lower boundary
Fuel PI Controller High P-Value	0x14a	330	Value	1	High P value used for PI controller
Fuel PI Controller High I-Value	0x14b	331	Value	1	High I value used for PI controller
Fuel PI Controller Low P-Value	0x14c	332	Value	1	Low P value used for PI controller
Fuel PI Controller Low I-Value	0x14d	333	Value	1	Low I value used for PI controller
Fuel PI Controller Idle P-Value	0x14e	334	Value	1	Idle P value used for PI controller
Fuel PI Controller Idle I-Value	0x14f	335	Value	1	Idle I value used for PI controller
Fuel Pulse Endpoint Table for Engine Temperature	0x150	336	Table	6	Fuel pulse endpoint temperature correction
Fuel Pulse Endpoint Table for Load	0x156	342	Table	6	Fuel pulse endpoint throttle correction
Table Lock Value	0x15c	348	Value	2	
Idle Spark Advance Temperature Adjustment	0x15e	350	Table	8	Idle spark advance temperature correction
WOT Spark Advance Reduction	0x166	358	Table	8	WOT spark advance reduction
Spark Advance Retard Configuration	0x16e	366	Bits	1	Spark advance and fuel reduction configuration
Spark Advance Reduction RPM Axis	0x170	368	Array	8	RPM values for spark advance and fuel reduction
Spark Advance Reduction	0x178	376	Array	4	The spark advance reduction while noise abatement is active
Spark Advance Reduction Ramp-In Duration	0x17c	380	Array	4	Spark advance reduction ramp-in duration
Spark Advance Reduction Hold Duration	0x180	384	Array	4	Spark advance reduction hold duration

BUEJAxxx / BUEKAxxx					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Spark Advance Reduction Ramp-Out Duration	0x184	388	Array	4	Spark advance reduction ramp-out duration
Soft Limit Ignition Pattern Front	0x188	392	Bits	1	Front Soft Limit Fire Pattern
Soft Limit Ignition Pattern Rear	0x189	393	Bits	1	Rear Soft Limit Fire Pattern
Hard Limit Ignition Pattern Front	0x18a	394	Bits	1	Front Hard Limit Fire Pattern
Hard Limit Ignition Pattern Rear	0x18b	395	Bits	1	Rear Hard Limit Fire Pattern
RPM Fixed Soft Limit Trigger	0x18c	396	Value	2	Fixed soft limit trigger RPM
RPM Fixed Soft Limit Recharge	0x18e	398	Value	2	Fixed soft limit release RPM
RPM Fixed Hard Limit Trigger	0x190	400	Value	2	Fixed hard limit trigger RPM
RPM Fixed Hard Limit Recharge	0x192	402	Value	2	Fixed hard limit release RPM
RPM Fixed Kill Limit Trigger	0x194	404	Value	2	Kill limit trigger RPM
RPM Fixed Kill Limit Recharge	0x196	406	Value	2	Kill limit release RPM
Rides Required to Clear DTC	0x1a8	424	Value	1	Number of rides without error codes set to clear store errors
Throttle Position Sensor Number of Errors	0x1a9	425	Value	1	Number of TPS read failures before error code is set
Throttle Position Sensor Highest Reading Allowed	0x1aa	426	Value	2	Maximum TPS reading
Throttle Position Sensor Lowest Reading Allowed	0x1ac	428	Value	2	Minimum TPS reading
Throttle Position Sensor Default Value	0x1ae	430	Value	2	TPS default value set on failure
O2 Sensor Test Minimum RPM	0x1b0	432	Value	2	Minimum RPM to check for O2 activity
O2 Sensor Test Minimum Throttle	0x1b2	434	Value	1	Minimum throttle to check for O2 activity
O2 Sensor Number of Inactive Reads	0x1b3	435	Value	1	Number of inactive results before error code is set
O2 Sensor Number of Errors	0x1b4	436	Value	1	Number of O2 sensor read failures before error code is set
Engine Temperature Sensor Number of Errors	0x1b5	437	Value	1	Number of ET sensor read failures before error code is set
Engine Temperature Sensor Highest Reading Allowed	0x1b6	438	Value	1	Maximum ET sensor reading
Engine Temperature Sensor Lowest Reading Allowed	0x1b7	439	Value	1	Minimum ET sensor reading
Engine Temperature Sensor Default Value	0x1b8	440	Value	1	ET sensor default value set on failure
Air Temperature Sensor Highest Reading Allowed	0x1b9	441	Value	1	Maximum allowed air temperature sensor reading
Air Temperature Sensor Lowest Reading Allowed	0x1ba	442	Value	1	Minimum allowed air temperature sensor reading
Air Temperature Sensor Default Value	0x1bb	443	Value	1	Air temperature sensor default value, set on failure
Air Temperature Sensor Number of Errors	0x1bc	444	Value	1	Number of air temperature sensor test failures before error code is set
Battery Voltage Number of Errors	0x1bd	445	Value	1	Number of battery voltage test failures before error code is set
Battery Voltage Highest Reading Allowed	0x1be	446	Value	2	Battery voltage maximum reading allowed
Battery Voltage Lowest Reading Allowed	0x1c0	448	Value	2	Battery voltage minimum reading allowed
Battery Voltage Default Value	0x1c2	450	Value	2	Battery voltage default value, set on failure
Injector Feedback Highest Reading Allowed	0x1c4	452	Value	1	Maximum injector feedback reading
Injector Feedback Lowest Reading Allowed	0x1c5	453	Value	1	Minimum injector feedback reading
Injector Feedback Number of Errors	0x1c6	454	Value	1	Number of injector feedback test failures before error code is set
Coil Feedback Highest Reading Allowed	0x1c7	455	Value	1	Maximum allowed coil feedback reading

BUEJAxxx / BUEKAxxx					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Coil Feedback Lowest Reading Allowed	0x1c8	456	Value	1	Minimum allowed coil feedback reading
Coil Feedback Number of Errors	0x1c9	457	Value	1	Number of failed coil feedback tests before error code is set
Fuel Pump Feedback Upper Limit	0x1ca	458	Value	1	Maximum fuelpump feedback reading
Fuel Pump Feedback Off Time before Test	0x1cb	459	Value	1	Off time before fuel pump feedback checked
Fuel Pump Feedback Number of Errors	0x1cc	460	Value	1	Number of fuelpump feedback test failures before error code is set
Tacho Feedback Number of Errors	0x1cd	461	Value	1	Number of tacho feedback test failures before error code is set
Bank Angle Sensor Highest Reading Allowed	0x1ce	462	Value	1	Maximum bank angle sensor reading allowed (also: shifter configuration)
Bank Angle Sensor Tip-Over Value	0x1cf	463	Value	1	Bank angle sensor tip-over value (also: shifter minimum delay between activations)
Bank Angle Sensor Lowest Reading Allowed	0x1d0	464	Value	1	Minimum bank angles sensor reading allowed (also: shifter debounce period)
Bank Angle Sensor Number of Errors	0x1d1	465	Value	1	Number of bank angle sensor test failures before error code is set (also: shifter fuel cut duration)
Bank Angle Sensor Tipover Delay	0x1d2	466	Value	1	Bank angle sensor tip-over detection delay (also: shifter maximum input activation value)
AD-Converter Number of Errors	0x1d3	467	Value	1	Number of failed A/D conversion tests before error code set
EEPROM Test Number of Errors	0x1d4	468	Value	1	Number of failed EEPROM checksum tests before error code set
Camshaft Sensor Test Number of Consecutive Sync Errors	0x1d5	469	Value	1	Number of consecutive out-of-sync revs before error code set
Camshaft Sensor Number of Sync Errors	0x1d6	470	Value	1	Number of revs without sync detected before error code set
Error Mask Byte 0	0x1d7	471	Bits	1	Diagnostic trouble code mask, byte 0
Error Mask Byte 1	0x1d8	472	Bits	1	Diagnostic trouble code mask, byte 1
Error Mask Byte 2	0x1d9	473	Bits	1	Diagnostic trouble code mask, byte 2
Error Mask Byte 3	0x1da	474	Bits	1	Diagnostic trouble code mask, byte 3
Dwell Duration	0x1db	475	Array	17	Dwell duration table
Timing Table Load Axis	0x1ec	492	Axis	10	Timing table load axis (y-axis)
Timing Table RPM Axis	0x1f6	502	Axis	20	Timing table RPM axis (x-axis)
Fuel Map Load Axis	0x20a	522	Axis	12	Fuel load axis
Fuel Map RPM Axis	0x216	534	Axis	26	Fuel RPM axis
Timing Table Front	0x230	560	Map	100	Timing table front cylinder
Timing Table Rear	0x294	660	Map	100	Timing table rear cylinder
Fuel Map Front	0x2f8	760	Map	156	Front fuel table
Fuel Map Rear	0x394	916	Map	156	Fuel map rear cylinder

20.2 BUECBxxx

BUECBxxx					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Stored Error Byte 1	0x1	1	Bits	1	Stored (historic) trouble codes, byte 1
Stored Error Byte 2	0x2	2	Bits	1	Stored (historic) trouble codes, byte 2
Stored Error Byte 3	0x3	3	Bits	1	Stored (historic) trouble codes, byte 3
Number of Rides since Error Set	0x4	4	Value	1	Number of rides since a trouble code was set
Calibration ID	0x5	5	Value	1	Country specific calibration identifier
AFV Rear	0x6	6	Value	2	Adaptive fuel value rear cylinder
System Configuration	0x8	8	Bits	1	Global ECM setup
Engine Running Minimum RPM	0xe	14	Value	2	Minimum RPM indicating a running engine (cranking otherwise)
Throttle Position Sensor Reset Voltage	0x12	18	Value	2	TPS voltage with a fully closde throttle, written on a TPS reset
Throttle Position Sensor Voltage Range	0x14	20	Value	2	TPS voltage difference from fully closed to WOT
Throttle Position Sensor Degrees Range	0x16	22	Value	2	TPS degrees difference from fully closed to WOT
Throttle Position Sensor Moving Average Fraction	0x18	24	Value	1	TPS fraction used to detect TP changes
O2 Sensor Target Voltage	0x19	25	Value	1	O2 sensor target voltage
O2 Sensor Rich Voltage	0x1a	26	Value	1	O2 sensor voltage indicating a rich mixture
O2 Sensor Lean Voltage	0x1b	27	Value	1	O2 sensor voltage indicating a lean mixture
Closed Loop Feature Minimum RPM	0x1c	28	Value	1	Minimum RPM to activate O2 sensor
Closed Loop Feature Minimum Throttle	0x1d	29	Value	1	Minimum throttle to activate O2 sensor
O2 Sensor Activation Time	0x1e	30	Value	1	O2 sensor activation delay
O2 Sensor Deactivation Time	0x1f	31	Value	1	O2 sensor deactivation delay
Startup Fuel Pulsewidth	0x20	32	Table	6	Starting fuel pulse length
Fuel Pump Duty Cycle Table	0x26	38	Table	6	Fuel pump duty cycle table
Fuel Pump Frequency	0x2c	44	Value	1	Fuel pump PWM frequency
Light Acceleration Condition	0x2d	45	Value	1	TPS change indicating a light accel. condition
Full Acceleration Condition	0x2e	46	Value	1	Change in throttle movement indicationg a full acceleration condition
Acceleration Enrichment Duration	0x2f	47	Value	1	Full acceleration enrichment duration in engine revs
Acceleration Enrichment Region	0x30	48	Table	4	Acceleration enrichment region
Acceleration Enrichment Temperature Adjustment	0x34	52	Table	8	Acceleration enrichment adjustment on engine temperature
Acceleration Enrichment	0x3c	60	Table	8	Acceleration enrichment
Deceleration Correction Region	0x44	68	Table	8	Deceleration correction region
Deceleration Correction	0x4c	76	Value	1	Deceleration correction
Deceleration Condition Hysteresis	0x4d	77	Value	1	Deceleration condition throttle hysteresis
Fuel Cut Region	0x4e	78	Table	4	Fuel cut region
Deceleration Learn Maximum RPM	0x52	82	Value	1	Deceleration learn mode maximum RPM
Deceleration Learn Minimum RPM	0x53	83	Value	1	Deceleration learn mode minimum RPM
Deceleration Learn Minimum Duration	0x54	84	Value	1	Engine revs for deceleration learn mode
Deceleration Learn Minimum Readings	0x55	85	Value	1	Number of consecutive rich O2 readings required
WOT Region	0x56	86	Table	4	Wide-Open Throttle definition
WOT Enrichment	0x5a	90	Value	2	Default fuel correction, applied to WOT regions
Idle Correction	0x5c	92	Table	8	Idle correction
Idle Maxiumum Engine Speed	0x64	100	Value	2	Idle region maximum RPM
Idle Maxiumum Load	0x66	102	Value	1	Idle region maximum throttle

BUECBxxx					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Open Loop Enrichment Delay	0x67	103	Value	1	Time before increasing AFV
Startup Enrichment Temperature Axis	0x68	104	Axis	4	Startup condition temperature axis
Startup Enrichment	0x6c	108	Table	4	Fuell correction after egine startup
Startup Enrichment Duration	0x70	112	Table	4	Duration of startup fuel enrichment
Open Loop Default Correction	0x74	116	Value	2	Default fuel correction, applied to open loop regions
Front Cylinder Correction	0x76	118	Table	8	Front cylinder fuel enrichment on engine temperature
Warmup Enrichment	0x7e	126	Table	28	Engine Temp fuel correction
Hot Start Condition	0x9a	154	Value	2	Engine temperature indicating a hot start condition
Engine Temperature Sensor Conversion Data	0x9c	156	Table	28	Engine temperature senor data
Air Temperature Correction	0xb8	184	Table	14	Air Temp correction
Air Temperature Sensor Data	0xc6	198	Table	28	Air temperature sensor data
Battery Voltage Correction	0xe2	226	Table	12	Battery voltage correction
Closed Loop Region Upper Boundary	0xee	238	Table	8	Closed loop upper boundary
Closed Loop Region Lower Boundary	0xf6	246	Table	18	Closed loop lower boundary
Closed Loop Upper Boundary Load Hysteresis	0x108	264	Value	1	Closed loop upper boundary throttle hysteresis
Closed Loop Lower Boundary Load Hysteresis	0x109	265	Value	1	Closed loop lower boundary throttle hysteresis
Closed Loop Upper Boundary RPM Hysteresis	0x10a	266	Value	2	Closed loop upper boundary RPM hysteresis
Closed Loop Lower Boundary RPM Hysteresis	0x10c	268	Value	2	Closed loop lower boundary RPM hysteresis
EGO Correction Maximum Value	0x10e	270	Value	2	Maximum closed loop EGO correction
EGO Correction Minimum Value	0x110	272	Value	2	Minimum closed loop EGO correction
Calibration Mode Number of Readings	0x112	274	Value	1	Number of O2 sensor readings required to adjust AFV
AFV Storage Delay	0x113	275	Value	1	Time between AFV writes to EEPROM
AFV Maximum Value	0x114	276	Value	2	Maximum allowed AFV
AFV Minimum Value	0x116	278	Value	2	Minimum allowed AFV
AFV Increase Factor	0x118	280	Value	2	Factor applied to increase AFV
AFV Decrease Factor	0x11a	282	Value	2	Factor applied to decrease AFV
Calibration Mode Maximum Engine Temperature	0x11c	284	Value	2	Maximum engine temperature to enable calibration mode
Calibration Mode Minimum Engine Temperature	0x11e	286	Value	2	Minimum engine temperature to enable calibration mode
Calibration Mode Region Upper Boundary	0x120	288	Table	8	Calibration mode region upper boundary
Calibration Mode Region Lower Boundary	0x128	296	Table	14	Calibration mode region lower boundary
Altitude Adjustement Lower Boundary	0x136	310	Table	6	Altitude adjustment lower boundary
Altitude Adjustment Upper Boundary	0x13c	316	Table	6	Altitude adjustment upper boundary
Fuel PI Controller High RPM Threshold	0x142	322	Value	1	PI controller high value RPM limit
Fuel PI Controller High Throttle Threshold	0x143	323	Value	1	PI controller high value throttle limit
Fuel PI Controller High P-Value	0x144	324	Value	1	High P value used for PI controller
Fuel PI Controller High I-Value	0x145	325	Value	1	High I value used for PI controller
Fuel PI Controller Low P-Value	0x146	326	Value	1	Low P value used for PI controller
Fuel PI Controller Low I-Value	0x147	327	Value	1	Low I value used for PI controller
Fuel PI Controller Idle P-Value	0x148	328	Value	1	Idle P value used for PI controller
Fuel PI Controller Idle I-Value	0x149	329	Value	1	Idle I value used for PI controller

BUECBxxx					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Fuel Pulse Endpoint Table for Engine Temperature	0x14a	330	Table	6	Fuel pulse endpoint temperature correction
Fuel Pulse Endpoint Table for Load	0x150	336	Table	6	Fuel pulse endpoint throttle correction
Table Lock Value	0x156	342	Value	2	
Idle Spark Advance Temperature Adjustment	0x158	344	Table	8	Idle spark advance temperature correction
WOT Spark Advance Reduction	0x160	352	Table	8	WOT spark advance reduction
Spark Advance Retard Configuration	0x168	360	Bits	1	Spark advance and fuel reduction configuration
Speed-RPM Ratio RPM Sample Duration	0x169	361	Value	1	Sample period for Speed-RPM ratio
Speed-RPM Ratio RPM Hysteresis High	0x16a	362	Value	1	Maximum speed-RPM ratio to enable reduction
Speed-RPM Ratio RPM Hysteresis Low	0x16b	363	Value	1	Minimum speed-RPM ratio to enable reduction
Spark Advance Reduction RPM Axis	0x16c	364	Array	8	RPM values for spark advance and fuel reduction
Spark Advance Reduction Fuel Correction	0x174	372	Array	4	Fuel correction during activation
Spark Advance Reduction	0x178	376	Array	4	The spark advance reduction while noise abatement is active
Spark Advance Reduction Ramp-In Duration	0x17c	380	Array	4	Spark advance reduction ramp-in duration
Spark Advance Reduction Hold Duration	0x180	384	Array	4	Spark advance reduction hold duration
Spark Advance Reduction Ramp-Out Duration	0x184	388	Array	4	Spark advance reduction ramp-out duration
Soft Limit Ignition Pattern Front	0x188	392	Bits	1	Front Soft Limit Fire Pattern
Soft Limit Ignition Pattern Rear	0x189	393	Bits	1	Rear Soft Limit Fire Pattern
Hard Limit Ignition Pattern Front	0x18a	394	Bits	1	Front Hard Limit Fire Pattern
Hard Limit Ignition Pattern Rear	0x18b	395	Bits	1	Rear Hard Limit Fire Pattern
RPM Fixed Soft Limit Trigger	0x18c	396	Value	1	Fixed soft limit trigger RPM
RPM Fixed Soft Limit Recharge	0x18d	397	Value	1	Fixed soft limit release RPM
RPM Fixed Hard Limit Trigger	0x18e	398	Value	1	Fixed hard limit trigger RPM
RPM Fixed Hard Limit Recharge	0x18f	399	Value	1	Fixed hard limit release RPM
RPM Fixed Kill Limit Trigger	0x190	400	Value	1	Kill limit trigger RPM
RPM Fixed Kill Limit Recharge	0x191	401	Value	1	Kill limit release RPM
RPM High Speed Hysteresis High Value	0x192	402	Value	1	High speed speed-RPM ration hysteresis, upper value
RPM High Speed Hysteresis Low Value	0x193	403	Value	1	High speed speed-RPM ration hysteresis, lower value
RPM High Speed Timed Limit Timer Start	0x194	404	Value	1	RPM threshold to start limit timer at high speed
RPM High Speed Timed Limit Timer Reset	0x195	405	Value	1	RPM threshold to reset limit timer at high speed
RPM High Speed Timed Hard Limit	0x196	406	Value	1	RPM threshold to enable delayed hard limit at high speed
RPM High Speed Timed Soft Limit	0x197	407	Value	1	RPM threshold to enable delayed soft limit at high speed
RPM High Speed Timed Soft Limit Delay	0x198	408	Value	1	Soft limit delay at high speed
RPM High Speed Timed Hard Limit Delay	0x199	409	Value	1	Hard limit delay at high speed
RPM Low Speed Timed Limit Timer Start	0x19a	410	Value	1	RPM threshold to start limit timer at low speed
RPM Low Speed Timed Limit Timer Reset	0x19b	411	Value	1	RPM threshold to reset limit timer at low speed
RPM Low Speed Timed Hard Limit	0x19c	412	Value	1	RPM threshold to enable delayed hard limit at low speed
RPM Low Speed Timed Soft Limit	0x19d	413	Value	1	RPM threshold to enable delayed soft limit at low speed

BUECBxxx					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
RPM Low Speed Timed Soft Limit Delay	0x19e	414	Value	1	Soft limit delay at low speed
RPM Low Speed Timed Hard Limit Delay	0x19f	415	Value	1	Hard limit delay at low speed
Temperature Soft Limit Minimum Load	0x1a0	416	Value	1	Minimum throttle to enable temperature soft limit
Temperature Soft Limit Minimum RPM	0x1a1	417	Value	1	Minimum RPM to enable temperature soft limit
Temperature Hard Limit Minimum Load	0x1a2	418	Value	1	Minimum throttle to enable temperature hard limit
Temperature Hard Limit Minimum RPM	0x1a3	419	Value	1	Minimum RPM to enable temperature hard limit
Temperature Soft Limit Trigger	0x1a4	420	Value	1	Temperature threshold to trigger soft limit
Temperature Soft Limit Recharge	0x1a5	421	Value	1	Temperature threshold to recharge soft limit
Temperature Hard Limit Trigger	0x1a6	422	Value	1	Temperature trheshold to trigger hard limit
Temperature Hard Limit Recharge	0x1a7	423	Value	1	Temperature threshold to recharge hard limit
Ignore Minimum RPM Trigger	0x1a8	424	Value	1	Temperature threshold indicating to ignore RPM/throttle limits
Ignore Minimum RPM Recharge	0x1a9	425	Value	1	Temperature threshold indicating to obey RPM/throttle limits
Temperature Kill Limit Trigger	0x1aa	426	Value	1	Temperature trheshold to trigger hard limit
Temperature Kill Limit Recharge	0x1ab	427	Value	1	Temperature threshold to recharge kill limit
Temperature Limit Engine Lamp On Value	0x1ac	428	Value	1	Temperature threshold to switch on engine lamp
Temperature Limit Engine Lamp Off Value	0x1ad	429	Value	1	Temperature threshold to switch off engine lamp
Fan Key-On On Temperature	0x1ae	430	Value	1	Temperature threshold to switch on fan
Fan Key-On Off Temperature	0x1af	431	Value	1	Temperature threshold to switch off fan
Fan Duty Cycle Forward	0x1b0	432	Table	8	Fan forward blowing duty cycle
Fan Duty Cycle Rearward	0x1b8	440	Table	8	Fan rearward blowing duty cycle
Fan Duty Cycle Period	0x1c0	448	Value	1	Cooling Fan Control Period
VS-RPM Ratio VS Sampling Time	0x1c1	449	Value	1	Time to count speed sensor pulses
Fan Forward Speed Hysteresis High	0x1c2	450	Value	1	Fan forward speed hysteresis upper value
Fan Forward Speed Hysteresis Low	0x1c3	451	Value	1	Fan forward speed hysteresis lower value
Fan Rearwards Speed Hysteresis High	0x1c4	452	Value	1	Fan rearward speed hysteresis upper value
Fan Rearwards Speed Hysteresis Low	0x1c5	453	Value	1	Fan rearward speed hysteresis lower value
Fan Stop Delay	0x1c6	454	Value	1	Fan off-time before direction change
Fan Relay Delay	0x1c7	455	Value	1	Fan direction change delay
Fan Key-Off Run Delay	0x1c8	456	Value	1	Key-off delay before starting fan
Fan Key-Off Run Duty Cycle	0x1c9	457	Value	1	Fan duty cycle after key-off
Fan Key-Off On Temperature	0x1ca	458	Value	1	Key-off temperature threshold to switch off fan
Fan Key-Off Off Temperature	0x1cb	459	Value	1	Key-off temperature threshold to switch on fan
Fan Key-Off Maximum Duration	0x1cc	460	Value	1	Maximum time running fan after key-off
Rides Required to Clear DTC	0x1ce	462	Value	1	Number of rides without error codes set to clear store errors
Throttle Position Sensor Number of Errors	0x1cf	463	Value	1	Number of TPS read failures before error code is set
Throttle Position Sensor Highest Reading Allowed	0x1d0	464	Value	2	Maximum TPS reading
Throttle Position Sensor Lowest Reading Allowed	0x1d2	466	Value	2	Minimum TPS reading
Throttle Position Sensor Default Value	0x1d4	468	Value	2	TPS default value set on failure
O2 Sensor Test Minimum RPM	0x1d6	470	Value	2	Minimum RPM to check for O2 activity

BUECBxxx					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
O2 Sensor Test Minimum Throttle	0x1d8	472	Value	1	Minimum throttle to check for O2 activity
O2 Sensor Number of Errors	0x1d9	473	Value	1	Number of O2 sensor read failures before error code is set
O2 Sensor Number of Inactive Reads	0x1da	474	Value	1	Number of inactive results before error code is set
Engine Temperature Sensor Number of Errors	0x1db	475	Value	1	Number of ET sensor read failures before error code is set
Engine Temperature Sensor Highest Reading Allowed	0x1dc	476	Value	1	Maximum ET sensor reading
Engine Temperature Sensor Lowest Reading Allowed	0x1dd	477	Value	1	Minimum ET sensor reading
Engine Temperature Sensor Default Value	0x1de	478	Value	1	ET sensor default value set on failure
Air Temperature Sensor Highest Reading Allowed	0x1df	479	Value	1	Maximum allowed air temperature sensor reading
Air Temperature Sensor Lowest Reading Allowed	0x1e0	480	Value	1	Minimum allowed air temperature sensor reading
Air Temperature Sensor Default Value	0x1e1	481	Value	1	Air temperature sensor default value, set on failure
Air Temperature Sensor Number of Errors	0x1e2	482	Value	1	Number of air temperature sensor test failures before error code is set
Battery Voltage Number of Errors	0x1e3	483	Value	1	Number of battery voltage test failures before error code is set
Battery Voltage Highest Reading Allowed	0x1e4	484	Value	2	Battery voltage maximum reading allowed
Battery Voltage Lowest Reading Allowed	0x1e6	486	Value	2	Battery voltage minimum reading allowed
Battery Voltage Default Value	0x1e8	488	Value	2	Battery voltage default value, set on failure
Injector Feedback Highest Reading Allowed	0x1ea	490	Value	1	Maximum injector feedback reading
Injector Feedback Lowest Reading Allowed	0x1eb	491	Value	1	Minimum injector feedback reading
Injector Feedback Number of Errors	0x1ec	492	Value	1	Number of injector feedback test failures before error code is set
Coil Feedback Highest Reading Allowed	0x1ed	493	Value	1	Maximum allowed coil feedback reading
Coil Feedback Lowest Reading Allowed	0x1ee	494	Value	1	Minimum allowed coil feedback reading
Coil Feedback Number of Errors	0x1ef	495	Value	1	Number of failed coil feedback tests before error code is set
Fuel Pump Feedback Upper Limit	0x1f0	496	Value	1	Maximum fuelpump feedback reading
Fuel Pump Feedback Off Time before Test	0x1f1	497	Value	1	Off time before fuel pump feedback checked
Fuel Pump Feedback Number of Errors	0x1f2	498	Value	1	Number of fuelpump feedback test failures before error code is set
Tacho Feedback Number of Errors	0x1f3	499	Value	1	Number of tacho feedback test failures before error code is set
Fan Feedback Upper Limit	0x1f4	500	Value	1	Maximum fan feedback reading
Fan Feedback Off Time before Test	0x1f5	501	Value	1	Fan off-time before running feedback test
Bank Angle Sensor Highest Reading Allowed	0x1f6	502	Value	1	Maximum bank angle sensor reading allowed (also: shifter configuration)
Fan Feedback Number of Errors	0x1f6	502	Value	1	Number of failed fan tests before error code is set
Bank Angle Sensor Tip-Over Value	0x1f7	503	Value	1	Bank angle sensor tip-over value (also: shifter minimum delay between activations)
Bank Angle Sensor Lowest Reading Allowed	0x1f8	504	Value	1	Minimum bank angles sensor reading allowed (also: shifter debounce period)
Bank Angle Sensor Number of Errors	0x1f9	505	Value	1	Number of bank angle sensor test failures before error code is set (also: shifter fuel cut duration)
Bank Angle Sensor Tipover Delay	0x1fa	506	Value	1	Bank angle sensor tip-over detection delay (also: shifter maximum input activation value)
EEPROM Test Number of Errors	0x1fb	507	Value	1	Number of failed EEPROM checksum tests before error

BUECBxxx					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
					code set
AD-Converter Number of Errors	0x1fc	508	Value	1	Number of failed A/D conversion tests before error code set
Camshaft Sensor Number of Sync Errors	0x1fd	509	Value	1	Number of revs without sync detected before error code set
Camshaft Sensor Test Number of Consecutive Sync Errors	0x1fe	510	Value	1	Number of consecutive out-of-sync revs before error code set
Error Mask Byte 0	0x1ff	511	Bits	1	Diagnostic trouble code mask, byte 0
Error Mask Byte 1	0x200	512	Bits	1	Diagnostic trouble code mask, byte 1
Error Mask Byte 2	0x201	513	Bits	1	Diagnostic trouble code mask, byte 2
Error Mask Byte 3	0x202	514	Bits	1	Diagnostic trouble code mask, byte 3
Error Mask Byte 4	0x203	515	Bits	1	Diagnostic trouble code mask, byte 4
Dwell Duration	0x204	516	Array	17	Dwell duration table
Timing Table Load Axis	0x216	534	Axis	10	Timing table load axis (y-axis)
Timing Table RPM Axis	0x220	544	Axis	20	Timing table RPM axis (x-axis)
Fuel Map Load Axis	0x234	564	Axis	12	Fuel load axis
Fuel Map RPM Axis	0x240	576	Axis	26	Fuel RPM axis
Timing Table Front	0x25a	602	Map	100	Timing table front cylinder
Timing Table Rear	0x2be	702	Map	100	Timing table rear cylinder
Fuel Map Front	0x322	802	Map	168	Front fuel table
Fuel Map Rear	0x3ca	970	Map	168	Fuel map rear cylinder

20.3 BUEGBxxx

BUEGBxxx					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Stored Error Byte 2	0x0	0	Bits	1	Stored (historic) trouble codes, byte 2
Stored Error Byte 3	0x1	1	Bits	1	Stored (historic) trouble codes, byte 3
Stored Error Byte 4	0x2	2	Bits	1	Stored (historic) trouble codes, byte 4
Stored Error Byte 5	0x3	3	Bits	1	Stored (historic) trouble codes, byte 5
Number of Rides since Error Set	0x4	4	Value	1	Number of rides since a trouble code was set
Calibration ID	0x5	5	Value	1	Country specific calibration identifier
AFV Rear	0x6	6	Value	2	Adaptive fuel value rear cylinder
System Configuration	0x8	8	Bits	1	Global ECM setup
Engine Running Minimum RPM	0xe	14	Value	2	Minimum RPM indicating a running engine (cranking otherwise)
Throttle Position Sensor Reset Voltage	0x12	18	Value	2	TPS voltage with a fully closde throttle, written on a TPS reset
Throttle Position Sensor Voltage Range	0x14	20	Value	2	TPS voltage difference from fully closed to WOT
Throttle Position Sensor Degrees Range	0x16	22	Value	2	TPS degrees difference from fully closed to WOT
Throttle Position Sensor Moving Average Fraction	0x18	24	Value	1	TPS fraction used to detect TP changes
O2 Sensor Target Voltage	0x19	25	Value	1	O2 sensor target voltage
O2 Sensor Rich Voltage	0x1a	26	Value	1	O2 sensor voltage indicating a rich mixture
O2 Sensor Lean Voltage	0x1b	27	Value	1	O2 sensor voltage indicating a lean mixture
Closed Loop Feature Minimum RPM	0x1c	28	Value	1	Minimum RPM to activate O2 sensor
Closed Loop Feature Minimum Throttle	0x1d	29	Value	1	Minimum throttle to activate O2 sensor
O2 Sensor Activation Time	0x1e	30	Value	1	O2 sensor activation delay
O2 Sensor Deactivation Time	0x1f	31	Value	1	O2 sensor deactivation delay
Startup Fuel Pulsewidth	0x20	32	Table	6	Starting fuel pulse length
Pre Sync Fuel Maximum Engine Temperature	0x26	38	Value	1	Max engine temp for pre-sync fuel pulses
Post Sync Fuel Maximum Engine Temperature	0x27	39	Value	1	Max engine temp for post-sync fuel pulses
Fuel Pump Duty Cycle Table	0x28	40	Table	6	Fuel pump duty cycle table
Fuel Pump Frequency	0x2e	46	Value	1	Fuel pump PWM frequency
Light Acceleration Condition	0x2f	47	Value	1	TPS change indicating a light accel. condition
Full Acceleration Condition	0x30	48	Value	1	Change in throttle movement indicationg a full acceleration condition
Acceleration Enrichment Duration	0x31	49	Value	1	Full acceleration enrichment duration in engine revs
Acceleration Enrichment Region	0x32	50	Table	4	Acceleration enrichment region
Acceleration Enrichment Temperature Adjustment	0x36	54	Table	8	Acceleration enrichment adjustment on engine temperature
Acceleration Enrichment	0x3e	62	Table	8	Acceleration enrichment
Deceleration Correction Region	0x46	70	Table	8	Deceleration correction region
Deceleration Correction	0x4e	78	Value	1	Deceleration correction
Deceleration Condition Hysteresis	0x4f	79	Value	1	Deceleration condition throttle hysteresis
Fuel Cut Region	0x50	80	Table	4	Fuel cut region
Deceleration Learn Maximum RPM	0x54	84	Value	1	Deceleration learn mode maximum RPM
Deceleration Learn Minimum RPM	0x55	85	Value	1	Deceleration learn mode minimum RPM
Deceleration Learn Minimum Duration	0x56	86	Value	1	Engine revs for deceleration learn mode

BUEGBxxx					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Deceleration Learn Minimum Readings	0x57	87	Value	1	Number of consecutive rich O2 readings required
WOT Region	0x58	88	Table	4	Wide-Open Throttle definition
WOT Enrichment	0x5c	92	Value	2	Default fuel correction, applied to WOT regions
Idle Correction	0x5e	94	Table	8	Idle correction
Idle Maxiumum Engine Speed	0x66	102	Value	2	Idle region maximum RPM
Idle Maxiumum Load	0x68	104	Value	1	Idle region maximum throttle
Open Loop Enrichment Delay	0x69	105	Value	1	Time before increasing AFV
Startup Enrichment Temperature Axis	0x6a	106	Axis	4	Startup condition temperature axis
Startup Enrichment	0x6e	110	Table	4	Fuell correction after egine startup
Startup Enrichment Duration	0x72	114	Table	4	Duration of startup fuel enrichment
Open Loop Default Correction	0x76	118	Value	2	Default fuel correction, applied to open loop regions
Front Cylinder Correction	0x78	120	Table	8	Front cylinder fuel enrichment on engine temperature
Warmup Enrichment	0x80	128	Table	28	Engine Temp fuel correction
Hot Start Condition	0x9c	156	Value	2	Engine temperature indicating a hot start condition
Engine Temperature Sensor Conversion Data	0x9e	158	Table	28	Engine temperature senor data
Air Temperature Correction	0xba	186	Table	14	Air Temp correction
Air Temperature Sensor Data	0xc8	200	Table	28	Air temperature sensor data
Battery Voltage Correction	0xe4	228	Table	12	Battery voltage correction
Airbox Pressure Configuration	0xf0	240	Bits	1	Air pressure sensor configuration byte
Baro Pressure Sensor Delay	0xf1	241	Value	1	Delay before reading barometric pressure sensor when switching on ignition
Barometric Pressure Key-On Minimum Value	0xf3	243	Value	1	Minimum valid barometric pressure sensor reading when switching on ignition
Barometric Pressure Key-On Maximum Value	0xf4	244	Value	1	Maximum valid barometric pressure sensor reading when switching on ignition
Airbox Pressure Sensor Data	0xf6	246	Table	10	Air Box Pressure conversion
Baro Correction	0x100	256	Table	10	Baro pressure correction
Airbox Pressure Correction	0x10a	266	Table	16	Airbox pressure correction
Closed Loop Region Upper Boundary	0x11a	282	Table	8	Closed loop upper boundary
Closed Loop Region Lower Boundary	0x122	290	Table	18	Closed loop lower boundary
Closed Loop Upper Boundary Load Hysteresis	0x134	308	Value	1	Closed loop upper boundary throttle hysteresis
Closed Loop Lower Boundary Load Hysteresis	0x135	309	Value	1	Closed loop lower boundary throttle hysteresis
Closed Loop Upper Boundary RPM Hysteresis	0x136	310	Value	2	Closed loop upper boundary RPM hysteresis
Closed Loop Lower Boundary RPM Hysteresis	0x138	312	Value	2	Closed loop lower boundary RPM hysteresis
EGO Correction Maximum Value	0x13a	314	Value	2	Maximum closed loop EGO correction
EGO Correction Minimum Value	0x13c	316	Value	2	Minimum closed loop EGO correction
Calibration Mode Number of Readings	0x13e	318	Value	1	Number of O2 sensor readings required to adjust AFV
AFV Storage Delay	0x13f	319	Value	1	Time between AFV writes to EEPROM
AFV Maximum Value	0x140	320	Value	2	Maximum allowed AFV
AFV Minimum Value	0x142	322	Value	2	Minimum allowed AFV
AFV Increase Factor	0x144	324	Value	2	Factor applied to increase AFV
AFV Decrease Factor	0x146	326	Value	2	Factor applied to decrease AFV
Calibration Mode Maximum Engine Temperature	0x148	328	Value	2	Maximum engine temperature to enable calibration mode
Calibration Mode Minimum Engine Temperature	0x14a	330	Value	2	Minimum engine temperature to enable calibration mode

BUEGBxxx					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Calibration Mode Region Upper Boundary	0x14c	332	Table	8	Calibration mode region upper boundary
Calibration Mode Region Lower Boundary	0x154	340	Table	14	Calibration mode region lower boundary
Altitude Adjustement Lower Boundary	0x162	354	Table	6	Altitude adjustment lower boundary
Altitude Adjustment Upper Boundary	0x168	360	Table	6	Altitude adjustment upper boundary
Fuel PI Controller High RPM Threshold	0x16e	366	Value	1	PI controller high value RPM limit
Fuel PI Controller High Throttle Threshold	0x16f	367	Value	1	PI controller high value throttle limit
Fuel PI Controller High P-Value	0x170	368	Value	1	High P value used for PI controller
Fuel PI Controller High I-Value	0x171	369	Value	1	High I value used for PI controller
Fuel PI Controller Low P-Value	0x172	370	Value	1	Low P value used for PI controller
Fuel PI Controller Low I-Value	0x173	371	Value	1	Low I value used for PI controller
Fuel PI Controller Idle P-Value	0x174	372	Value	1	Idle P value used for PI controller
Fuel PI Controller Idle I-Value	0x175	373	Value	1	Idle I value used for PI controller
Fuel Pulse Endpoint Table for Engine Temperature	0x176	374	Table	6	Fuel pulse endpoint temperature correction
Fuel Pulse Endpoint Table for Load	0x17c	380	Table	6	Fuel pulse endpoint throttle correction
Table Lock Value	0x182	386	Value	2	
Idle Spark Advance Temperature Adjustment	0x184	388	Table	8	Idle spark advance temperature correction
WOT Spark Advance Reduction	0x18c	396	Table	8	WOT spark advance reduction
Spark Advance Retard Configuration	0x194	404	Bits	1	Spark advance and fuel reduction configuration
Speed-RPM Ratio RPM Sample Duration	0x195	405	Value	1	Sample period for Speed-RPM ratio
Spark Advance Reduction VSS RPM Ratio	0x196	406	Array	5	Speed-RPM ratio values for spark advance and fuel reduction
Spark Advance Retard Minimum Engine Temperature	0x19b	411	Value	1	Minimum engine temperature to enable reduction
Spark Advance Reduction Upper RPM Boundary	0x19c	412	Array	6	Maximum RPM to enable reduction
Spark Advance Reduction Lower RPM boundary	0x1a2	418	Array	6	Minimum RPM to enable reduction
Spark Advance Reduction Fuel Correction	0x1a8	424	Array	6	Fuel correction during activation
Spark Advance Reduction	0x1ae	430	Array	6	The spark advance reduction while noise abatement is active
Spark Advance Reduction Ramp-In Duration	0x1b4	436	Array	6	Spark advance reduction ramp-in duration
Spark Advance Reduction Hold Duration	0x1ba	442	Array	6	Spark advance reduction hold duration
Spark Advance Reduction Ramp-Out Duration	0x1c0	448	Array	6	Spark advance reduction ramp-out duration
RPM Fixed Soft Limit Trigger	0x1ca	458	Value	1	Fixed soft limit trigger RPM
RPM Fixed Soft Limit Recharge	0x1cb	459	Value	1	Fixed soft limit release RPM
Soft Limit Ignition Pattern Front	0x1cc	460	Bits	1	Front Soft Limit Fire Pattern
RPM Fixed Hard Limit Trigger	0x1cc	460	Value	1	Fixed hard limit trigger RPM
Soft Limit Ignition Pattern Rear	0x1cd	461	Bits	1	Rear Soft Limit Fire Pattern
RPM Fixed Hard Limit Recharge	0x1cd	461	Value	1	Fixed hard limit release RPM
Hard Limit Ignition Pattern Front	0x1ce	462	Bits	1	Front Hard Limit Fire Pattern
RPM Fixed Kill Limit Trigger	0x1ce	462	Value	1	Kill limit trigger RPM
Hard Limit Ignition Pattern Rear	0x1cf	463	Bits	1	Rear Hard Limit Fire Pattern
RPM Fixed Kill Limit Recharge	0x1cf	463	Value	1	Kill limit release RPM

BUEGBxxx					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
RPM High Speed Hysteresis High Value	0x1d0	464	Value	1	High speed speed-RPM ration hysteresis, upper value
RPM High Speed Hysteresis Low Value	0x1d1	465	Value	1	High speed speed-RPM ration hysteresis, lower value
RPM High Speed Timed Limit Timer Start	0x1d2	466	Value	1	RPM threshold to start limit timer at high speed
RPM High Speed Timed Limit Timer Reset	0x1d3	467	Value	1	RPM threshold to reset limit timer at high speed
RPM High Speed Timed Hard Limit	0x1d4	468	Value	1	RPM threshold to enable delayed hard limit at high speed
RPM High Speed Timed Soft Limit	0x1d5	469	Value	1	RPM threshold to enable delayed soft limit at high speed
RPM High Speed Timed Soft Limit Delay	0x1d6	470	Value	1	Soft limit delay at high speed
RPM High Speed Timed Hard Limit Delay	0x1d7	471	Value	1	Hard limit delay at high speed
RPM Low Speed Timed Limit Timer Start	0x1d8	472	Value	1	RPM threshold to start limit timer at low speed
RPM Low Speed Timed Limit Timer Reset	0x1d9	473	Value	1	RPM threshold to reset limit timer at low speed
RPM Low Speed Timed Hard Limit	0x1da	474	Value	1	RPM threshold to enable delayed hard limit at low speed
RPM Low Speed Timed Soft Limit	0x1db	475	Value	1	RPM threshold to enable delayed soft limit at low speed
RPM Low Speed Timed Soft Limit Delay	0x1dc	476	Value	1	Soft limit delay at low speed
RPM Low Speed Timed Hard Limit Delay	0x1dd	477	Value	1	Hard limit delay at low speed
Temperature Soft Limit Minimum Load	0x1de	478	Value	1	Minimum throttle to enable temperature soft limit
Temperature Soft Limit Minimum RPM	0x1df	479	Value	1	Minimum RPM to enable temperature soft limit
Temperature Hard Limit Minimum Load	0x1e0	480	Value	1	Minimum throttle to enable temperature hard limit
Temperature Hard Limit Minimum RPM	0x1e1	481	Value	1	Minimum RPM to enable temperature hard limit
Temperature Soft Limit Trigger	0x1e2	482	Value	1	Temperature threshold to trigger soft limit
Temperature Soft Limit Recharge	0x1e3	483	Value	1	Temperature threshold to recharge soft limit
Temperature Hard Limit Trigger	0x1e4	484	Value	1	Temperature trheshold to trigger hard limit
Temperature Hard Limit Recharge	0x1e5	485	Value	1	Temperature threshold to recharge hard limit
Ignore Minimum RPM Trigger	0x1e6	486	Value	1	Temperature threshold indicating to ignore RPM/throttle limits
Ignore Minimum RPM Recharge	0x1e7	487	Value	1	Temperature threshold indicating to obey RPM/throttle limits
Temperature Kill Limit Trigger	0x1e8	488	Value	1	Temperature trheshold to trigger hard limit
Temperature Kill Limit Recharge	0x1e9	489	Value	1	Temperature threshold to recharge kill limit
Temperature Limit Engine Lamp On Value	0x1ea	490	Value	1	Temperature threshold to switch on engine lamp
Temperature Limit Engine Lamp Off Value	0x1eb	491	Value	1	Temperature threshold to switch off engine lamp
Fan Key-On On Temperature	0x1ec	492	Value	1	Temperature threshold to switch on fan
Fan Key-On Off Temperature	0x1ed	493	Value	1	Temperature threshold to switch off fan
Fan Key-On Duty Cycle	0x1ee	494	Table	8	Fan key-on duty cycle
Fan Duty Cycle Frequency	0x1ee	494	Value	1	Fan duty cycle PWM frequency
VS-RPM Ratio VS Sampling Time	0x1f7	503	Value	1	Time to count speed sensor pulses
Fan Key-Off Run Delay	0x1f8	504	Value	1	Key-off delay before starting fan
Fan Key-Off Run Duty Cycle	0x1f9	505	Value	1	Fan duty cycle after key-off
Fan Key-Off On Temperature	0x1fa	506	Value	1	Key-off temperature threshold to switch off fan
Fan Key-Off Off Temperature	0x1fb	507	Value	1	Key-off temperature threshold to switch on fan

BUEGBxxx					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Fan Key-Off Maximum Duration	0x1fc	508	Value	1	Maximum time running fan after key-off
Fan Key-Off Minimum Battery Voltage	0x1fd	509	Value	1	Minimum battery voltage to run fan after key-off
Active Muffler Configuration	0x1fe	510	Bits	1	Active Muffler Valve Configuration
Active Muffler WOT Condition Hysteresis	0x1ff	511	Value	1	Active exhaust valve WOT condition hysteresis
Active Muffler Motor Minimum On Time	0x200	512	Value	1	Active exhaust valve controller minimum on-time
Active Muffler Motor Minimum Off Time	0x201	513	Value	1	Active exhaust valve controller minimum off-time
Active Muffler Valve Switching Points	0x202	514	Array	6	Active exhaust valve switching RPMs
Rides Required to Clear DTC	0x208	520	Value	1	Number of rides without error codes set to clear store errors
Throttle Position Sensor Number of Errors	0x209	521	Value	1	Number of TPS read failures before error code is set
Throttle Position Sensor Highest Reading Allowed	0x20a	522	Value	2	Maximum TPS reading
Throttle Position Sensor Lowest Reading Allowed	0x20c	524	Value	2	Minimum TPS reading
Throttle Position Sensor Default Value	0x20e	526	Value	2	TPS default value set on failure
O2 Sensor Test Minimum RPM	0x210	528	Value	2	Minimum RPM to check for O2 activity
O2 Sensor Test Minimum Throttle	0x212	530	Value	1	Minimum throttle to check for O2 activity
O2 Sensor Number of Errors	0x213	531	Value	1	Number of O2 sensor read failures before error code is set
O2 Sensor Number of Inactive Reads	0x214	532	Value	1	Number of inactive results before error code is set
Engine Temperature Sensor Number of Errors	0x215	533	Value	1	Number of ET sensor read failures before error code is set
Engine Temperature Sensor Highest Reading Allowed	0x216	534	Value	1	Maximum ET sensor reading
Engine Temperature Sensor Lowest Reading Allowed	0x217	535	Value	1	Minimum ET sensor reading
Engine Temperature Sensor Default Value	0x218	536	Value	1	ET sensor default value set on failure
Air Temperature Sensor Highest Reading Allowed	0x219	537	Value	1	Maximum allowed air temperature sensor reading
Air Temperature Sensor Lowest Reading Allowed	0x21a	538	Value	1	Minimum allowed air temperature sensor reading
Air Temperature Sensor Default Value	0x21b	539	Value	1	Air temperature sensor default value, set on failure
Air Temperature Sensor Number of Errors	0x21c	540	Value	1	Number of air temperature sensor test failures before error code is set
Battery Voltage Number of Errors	0x21d	541	Value	1	Number of battery voltage test failures before error code is set
Battery Voltage Highest Reading Allowed	0x21e	542	Value	2	Battery voltage maximum reading allowed
Battery Voltage Lowest Reading Allowed	0x220	544	Value	2	Battery voltage minimum reading allowed
Battery Voltage Default Value	0x222	546	Value	2	Battery voltage default value, set on failure
Active Muffler Controller Number of Tests Failed	0x224	548	Value	1	Number of AMC test failures before error code is set
Active Muffler Controller Max Feedback Time	0x225	549	Value	1	Maximum time allowed for AMC feedback
Injector Feedback Highest Reading Allowed	0x226	550	Value	1	Maximum injector feedback reading
Injector Feedback Lowest Reading Allowed	0x227	551	Value	1	Minimum injector feedback reading
Injector Feedback Number of Errors	0x228	552	Value	1	Number of injector feedback test failures before error code is set

BUEGBxxx					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Coil Feedback Highest Reading Allowed	0x229	553	Value	1	Maximum allowed coil feedback reading
Coil Feedback Lowest Reading Allowed	0x22a	554	Value	1	Minimum allowed coil feedback reading
Bank Angle Sensor Lowest Reading Allowed	0x22b	555	Value	1	Minimum bank angles sensor reading allowed (also: shifter debounce period)
Coil Feedback Number of Errors	0x22b	555	Value	1	Number of failed coil feedback tests before error code is set
Fuel Pump Feedback Upper Limit	0x22c	556	Value	1	Maximum fuelpump feedback reading
Fuel Pump Feedback Off Time before Test	0x22d	557	Value	1	Off time before fuel pump feedback checked
Fuel Pump Feedback Number of Errors	0x22e	558	Value	1	Number of fuelpump feedback test failures before error code is set
Tacho Feedback Number of Errors	0x22f	559	Value	1	Number of tacho feedback test failures before error code is set
Fan Feedback Upper Limit	0x230	560	Value	1	Maximum fan feedback reading
Fan Feedback Off Time before Test	0x231	561	Value	1	Fan off-time before running feedback test
Fan Feedback Number of Errors	0x232	562	Value	1	Number of failed fan tests before error code is set
Bank Angle Sensor Highest Reading Allowed	0x233	563	Value	1	Maximum bank angle sensor reading allowed (also: shifter configuration)
Bank Angle Sensor Tip-Over Value	0x234	564	Value	1	Bank angle sensor tip-over value (also: shifter minimum delay between activations)
Bank Angle Sensor Number of Errors	0x236	566	Value	1	Number of bank angle sensor test failures before error code is set (also: shifter fuel cut duration)
Bank Angle Sensor Tipover Delay	0x237	567	Value	1	Bank angle sensor tip-over detection delay (also: shifter maximum input activation value)
EEPROM Test Number of Errors	0x238	568	Value	1	Number of failed EEPROM checksum tests before error code set
AD-Converter Number of Errors	0x239	569	Value	1	Number of failed A/D conversion tests before error code set
Camshaft Sensor Number of Sync Errors	0x23a	570	Value	1	Number of revs without sync detected before error code set
Camshaft Sensor Test Number of Consecutive Sync Errors	0x23b	571	Value	1	Number of consecutive out-of-sync revs before error code set
Dwell Duration	0x241	577	Array	17	Dwell duration table
Error Mask Byte 1	0x244	580	Bits	1	Diagnostic trouble code mask, byte 1
Error Mask Byte 2	0x245	581	Bits	1	Diagnostic trouble code mask, byte 2
Error Mask Byte 3	0x246	582	Bits	1	Diagnostic trouble code mask, byte 3
Error Mask Byte 4	0x247	583	Bits	1	Diagnostic trouble code mask, byte 4
Error Mask Byte 5	0x248	584	Bits	1	Diagnostic trouble code mask, byte 5
Timing Table Load Axis	0x252	594	Axis	10	Timing table load axis (y-axis)
Timing Table RPM Axis	0x25c	604	Axis	20	Timing table RPM axis (x-axis)
Fuel Map Load Axis	0x270	624	Axis	12	Fuel load axis
Fuel Map RPM Axis	0x27c	636	Axis	26	Fuel RPM axis
Timing Table Front	0x296	662	Map	100	Timing table front cylinder
Timing Table Rear	0x2fa	762	Map	100	Timing table rear cylinder
Fuel Map Front	0x35e	862	Map	168	Front fuel table
Fuel Map Rear	0x406	1030	Map	168	Fuel map rear cylinder

20.4 BUEIBxxx / B2RIBxxx / BUEICxxx

BUEIBxxx / B2RIBxxx / BUEICxxx					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Stored Error Byte 1	0x0	0	Bits	1	Stored (historic) trouble codes, byte 1
Stored Error Byte 2	0x1	1	Bits	1	Stored (historic) trouble codes, byte 2
Stored Error Byte 3	0x2	2	Bits	1	Stored (historic) trouble codes, byte 3
Stored Error Byte 4	0x3	3	Bits	1	Stored (historic) trouble codes, byte 4
Number of Rides since Error Set	0x4	4	Value	1	Number of rides since a trouble code was set
Calibration ID	0x5	5	Value	1	Country specific calibration identifier
AFV Rear	0x6	6	Value	2	Adaptive fuel value rear cylinder
System Configuration	0x8	8	Bits	1	Global ECM setup
Engine Running Minimum RPM	0xe	14	Value	2	Minimum RPM indicating a running engine (cranking otherwise)
Throttle Position Sensor Reset Voltage	0x12	18	Value	2	TPS voltage with a fully closde throttle, written on a TPS reset
Throttle Position Sensor Voltage Range	0x14	20	Value	2	TPS voltage difference from fully closed to WOT
Throttle Position Sensor Degrees Range	0x16	22	Value	2	TPS degrees difference from fully closed to WOT
Throttle Position Sensor Moving Average Fraction	0x18	24	Value	1	TPS fraction used to detect TP changes
O2 Sensor Target Voltage	0x19	25	Value	1	O2 sensor target voltage
O2 Sensor Rich Voltage	0x1a	26	Value	1	O2 sensor voltage indicating a rich mixture
O2 Sensor Lean Voltage	0x1b	27	Value	1	O2 sensor voltage indicating a lean mixture
Closed Loop Feature Minimum RPM	0x1c	28	Value	1	Minimum RPM to activate O2 sensor
Closed Loop Feature Minimum Throttle	0x1d	29	Value	1	Minimum throttle to activate O2 sensor
O2 Sensor Activation Time	0x1e	30	Value	1	O2 sensor activation delay
O2 Sensor Deactivation Time	0x1f	31	Value	1	O2 sensor deactivation delay
Startup Fuel Pulsewidth	0x20	32	Table	6	Starting fuel pulse length
Pre Sync Fuel Maximum Engine Temperature	0x26	38	Value	1	Max engine temp for pre-sync fuel pulses
Post Sync Fuel Maximum Engine Temperature	0x27	39	Value	1	Max engine temp for post-sync fuel pulses
Fuel Pump Duty Cycle Table	0x28	40	Table	6	Fuel pump duty cycle table
Fuel Pump Frequency	0x2e	46	Value	1	Fuel pump PWM frequency
Light Acceleration Condition	0x2f	47	Value	1	TPS change indicating a light accel. condition
Full Acceleration Condition	0x30	48	Value	1	Change in throttle movement indicationg a full acceleration condition
Acceleration Enrichment Duration	0x31	49	Value	1	Full acceleration enrichment duration in engine revs
Acceleration Enrichment Region	0x32	50	Table	4	Acceleration enrichment region
Acceleration Enrichment Temperature Adjustment	0x36	54	Table	8	Acceleration enrichment adjustment on engine temperature
Acceleration Enrichment	0x3e	62	Table	8	Acceleration enrichment
Deceleration Correction Region	0x46	70	Table	8	Deceleration correction region
Deceleration Correction	0x4e	78	Value	1	Deceleration correction
Deceleration Condition Hysteresis	0x4f	79	Value	1	Deceleration condition throttle hysteresis
Fuel Cut Region	0x50	80	Table	4	Fuel cut region
Deceleration Learn Maximum RPM	0x54	84	Value	1	Deceleration learn mode maximum RPM
Deceleration Learn Minimum RPM	0x55	85	Value	1	Deceleration learn mode minimum RPM
Deceleration Learn Minimum Duration	0x56	86	Value	1	Engine revs for deceleration learn mode
Deceleration Learn Minimum Readings	0x57	87	Value	1	Number of consecutive rich O2 readings required

BUEIBxxx / B2RIBxxx / BUEICxxx					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
WOT Region	0x58	88	Table	4	Wide-Open Throttle definition
WOT Enrichment	0x5c	92	Value	2	Default fuel correction, applied to WOT regions
Idle Correction	0x5e	94	Table	8	Idle correction
Idle Maxiumum Engine Speed	0x66	102	Value	2	Idle region maximum RPM
Idle Maxiumum Load	0x68	104	Value	1	Idle region maximum throttle
Open Loop Enrichment Delay	0x69	105	Value	1	Time before increasing AFV
Startup Enrichment Temperature Axis	0x6a	106	Axis	4	Startup condition temperature axis
Startup Enrichment	0x6e	110	Table	4	Fuell correction after egine startup
Startup Enrichment Duration	0x72	114	Table	4	Duration of startup fuel enrichment
Open Loop Default Correction	0x76	118	Value	2	Default fuel correction, applied to open loop regions
Front Cylinder Correction	0x78	120	Table	8	Front cylinder fuel enrichment on engine temperature
Warmup Enrichment	0x80	128	Table	28	Engine Temp fuel correction
Hot Start Condition	0x9c	156	Value	2	Engine temperature indicating a hot start condition
Engine Temperature Sensor Conversion Data	0x9e	158	Table	28	Engine temperature senor data
Air Temperature Correction	0xba	186	Table	14	Air Temp correction
Air Temperature Sensor Data	0xc8	200	Table	28	Air temperature sensor data
Battery Voltage Correction	0xe4	228	Table	12	Battery voltage correction
Airbox Pressure Configuration	0xf0	240	Bits	1	Air pressure sensor configuration byte
Baro Pressure Sensor Delay	0xf1	241	Value	1	Delay before reading barometric pressure sensor when switching on ignition
Baro Pressure Blip	0xf2	242	Value	1	Camshaft or crankshaft position to read pressure sensor.
Barometric Pressure Key-On Minimum Value	0xf3	243	Value	1	Minimum valid barometric pressure sensor reading when switching on ignition
Barometric Pressure Key-On Maximum Value	0xf4	244	Value	1	Maximum valid barometric pressure sensor reading when switching on ignition
Airbox Pressure Sensor Data	0xf6	246	Table	10	Air Box Pressure conversion
Baro Correction	0x100	256	Table	10	Baro pressure correction
Airbox Pressure Correction	0x10a	266	Table	16	Airbox pressure correction
Closed Loop Region Upper Boundary	0x11a	282	Table	8	Closed loop upper boundary
Closed Loop Region Lower Boundary	0x122	290	Table	18	Closed loop lower boundary
Closed Loop Upper Boundary Load Hysteresis	0x134	308	Value	1	Closed loop upper boundary throttle hysteresis
Closed Loop Lower Boundary Load Hysteresis	0x135	309	Value	1	Closed loop lower boundary throttle hysteresis
Closed Loop Upper Boundary RPM Hysteresis	0x136	310	Value	2	Closed loop upper boundary RPM hysteresis
Closed Loop Lower Boundary RPM Hysteresis	0x138	312	Value	2	Closed loop lower boundary RPM hysteresis
EGO Correction Maximum Value	0x13a	314	Value	2	Maximum closed loop EGO correction
EGO Correction Minimum Value	0x13c	316	Value	2	Minimum closed loop EGO correction
Calibration Mode Number of Readings	0x13e	318	Value	1	Number of O2 sensor readings required to adjust AFV
AFV Storage Delay	0x13f	319	Value	1	Time between AFV writes to EEPROM
AFV Maximum Value	0x140	320	Value	2	Maximum allowed AFV
AFV Minimum Value	0x142	322	Value	2	Minimum allowed AFV
AFV Increase Factor	0x144	324	Value	2	Factor applied to increase AFV
AFV Decrease Factor	0x146	326	Value	2	Factor applied to decrease AFV
Calibration Mode Maximum Engine Temperature	0x148	328	Value	2	Maximum engine temperature to enable calibration mode
Calibration Mode Minimum Engine Temperature	0x14a	330	Value	2	Minimum engine temperature to enable calibration mode
Calibration Mode Region Upper Boundary	0x14c	332	Table	8	Calibration mode region upper boundary

BUEIBxxx / B2RIBxxx / BUEICxxx					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Calibration Mode Region Lower Boundary	0x154	340	Table	14	Calibration mode region lower boundary
Altitude Adjustement Lower Boundary	0x162	354	Table	6	Altitude adjustment lower boundary
Altitude Adjustment Upper Boundary	0x168	360	Table	6	Altitude adjustment upper boundary
Fuel PI Controller High RPM Threshold	0x16e	366	Value	1	PI controller high value RPM limit
Fuel PI Controller High Throttle Threshold	0x16f	367	Value	1	PI controller high value throttle limit
Fuel PI Controller High P-Value	0x170	368	Value	1	High P value used for PI controller
Fuel PI Controller High I-Value	0x171	369	Value	1	High I value used for PI controller
Fuel PI Controller Low P-Value	0x172	370	Value	1	Low P value used for PI controller
Fuel PI Controller Low I-Value	0x173	371	Value	1	Low I value used for PI controller
Fuel PI Controller Idle P-Value	0x174	372	Value	1	Idle P value used for PI controller
Fuel PI Controller Idle I-Value	0x175	373	Value	1	Idle I value used for PI controller
Fuel Pulse Endpoint Table for Engine Temperature	0x176	374	Table	6	Fuel pulse endpoint temperature correction
Fuel Pulse Endpoint Table for Load	0x17c	380	Table	6	Fuel pulse endpoint throttle correction
Table Lock Value	0x182	386	Value	2	
Idle Spark Advance Temperature Adjustment	0x184	388	Table	8	Idle spark advance temperature correction
WOT Spark Advance Reduction	0x18c	396	Table	8	WOT spark advance reduction
Spark Advance Retard Configuration	0x194	404	Bits	1	Spark advance and fuel reduction configuration
Speed-RPM Ratio RPM Sample Duration	0x195	405	Value	1	Sample period for Speed-RPM ratio
Spark Advance Reduction VSS RPM Ratio	0x196	406	Array	5	Speed-RPM ratio values for spark advance and fuel reduction
Spark Advance Retard Minimum Engine Temperature	0x19b	411	Value	1	Minimum engine temperature to enable reduction
Spark Advance Reduction Upper RPM Boundary	0x19c	412	Array	6	Maximum RPM to enable reduction
Spark Advance Reduction Lower RPM boundary	0x1a2	418	Array	6	Minimum RPM to enable reduction
Spark Advance Reduction Fuel Correction	0x1a8	424	Array	6	Fuel correction during activation
Spark Advance Reduction	0x1ae	430	Array	6	The spark advance reduction while noise abatement is active
Spark Advance Reduction Ramp-In Duration	0x1b4	436	Array	6	Spark advance reduction ramp-in duration
Spark Advance Reduction Hold Duration	0x1ba	442	Array	6	Spark advance reduction hold duration
Spark Advance Reduction Ramp-Out Duration	0x1c0	448	Array	6	Spark advance reduction ramp-out duration
Active Intake Period	0x1c6	454	Value	1	Active intake control period
Active Intake Ramp In Duty Cycle	0x1c8	456	Value	1	Active intake ramp-in period duty cycle
Active Intake Hold Duty Cycle	0x1c9	457	Value	1	Active intake hold period duty cycle
Active Intake Ramp Out Duty Cycle	0x1ca	458	Value	1	Active intake ramp-out period duty cycle
Soft Limit Ignition Pattern Front	0x1cc	460	Bits	1	Front Soft Limit Fire Pattern
Soft Limit Ignition Pattern Rear	0x1cd	461	Bits	1	Rear Soft Limit Fire Pattern
Hard Limit Ignition Pattern Front	0x1ce	462	Bits	1	Front Hard Limit Fire Pattern
Hard Limit Ignition Pattern Rear	0x1cf	463	Bits	1	Rear Hard Limit Fire Pattern
RPM Fixed Soft Limit Trigger	0x1d0	464	Value	1	Fixed soft limit trigger RPM
RPM Fixed Soft Limit Recharge	0x1d1	465	Value	1	Fixed soft limit release RPM
RPM Fixed Hard Limit Trigger	0x1d2	466	Value	1	Fixed hard limit trigger RPM
RPM Fixed Hard Limit Recharge	0x1d3	467	Value	1	Fixed hard limit release RPM

BUEIBxxx / B2RIBxxx / BUEICxxx					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
RPM Fixed Kill Limit Trigger	0x1d4	468	Value	1	Kill limit trigger RPM
RPM Fixed Kill Limit Recharge	0x1d5	469	Value	1	Kill limit release RPM
RPM High Speed Hysteresis High Value	0x1d6	470	Value	1	High speed speed-RPM ration hysteresis, upper value
RPM High Speed Hysteresis Low Value	0x1d7	471	Value	1	High speed speed-RPM ration hysteresis, lower value
RPM High Speed Timed Limit Timer Start	0x1d8	472	Value	1	RPM threshold to start limit timer at high speed
RPM High Speed Timed Limit Timer Reset	0x1d9	473	Value	1	RPM threshold to reset limit timer at high speed
RPM High Speed Timed Hard Limit	0x1da	474	Value	1	RPM threshold to enable delayed hard limit at high speed
RPM High Speed Timed Soft Limit	0x1db	475	Value	1	RPM threshold to enable delayed soft limit at high speed
RPM High Speed Timed Soft Limit Delay	0x1dc	476	Value	1	Soft limit delay at high speed
RPM High Speed Timed Hard Limit Delay	0x1dd	477	Value	1	Hard limit delay at high speed
RPM Low Speed Timed Limit Timer Start	0x1de	478	Value	1	RPM threshold to start limit timer at low speed
RPM Low Speed Timed Limit Timer Reset	0x1df	479	Value	1	RPM threshold to reset limit timer at low speed
RPM Low Speed Timed Hard Limit	0x1e0	480	Value	1	RPM threshold to enable delayed hard limit at low speed
RPM Low Speed Timed Soft Limit	0x1e1	481	Value	1	RPM threshold to enable delayed soft limit at low speed
RPM Low Speed Timed Soft Limit Delay	0x1e2	482	Value	1	Soft limit delay at low speed
RPM Low Speed Timed Hard Limit Delay	0x1e3	483	Value	1	Hard limit delay at low speed
Temperature Soft Limit Minimum Load	0x1e4	484	Value	1	Minimum throttle to enable temperature soft limit
Temperature Soft Limit Minimum RPM	0x1e5	485	Value	1	Minimum RPM to enable temperature soft limit
Temperature Hard Limit Minimum Load	0x1e6	486	Value	1	Minimum throttle to enable temperature hard limit
Temperature Hard Limit Minimum RPM	0x1e7	487	Value	1	Minimum RPM to enable temperature hard limit
Temperature Soft Limit Trigger	0x1e8	488	Value	1	Temperature threshold to trigger soft limit
Temperature Soft Limit Recharge	0x1e9	489	Value	1	Temperature threshold to recharge soft limit
Temperature Hard Limit Trigger	0x1ea	490	Value	1	Temperature trheshold to trigger hard limit
Temperature Hard Limit Recharge	0x1eb	491	Value	1	Temperature threshold to recharge hard limit
Ignore Minimum RPM Trigger	0x1ec	492	Value	1	Temperature threshold indicating to ignore RPM/throttle limits
Ignore Minimum RPM Recharge	0x1ed	493	Value	1	Temperature threshold indicating to obey RPM/throttle limits
Temperature Kill Limit Trigger	0x1ee	494	Value	1	Temperature trheshold to trigger hard limit
Temperature Kill Limit Recharge	0x1ef	495	Value	1	Temperature threshold to recharge kill limit
Temperature Limit Engine Lamp On Value	0x1f0	496	Value	1	Temperature threshold to switch on engine lamp
Temperature Limit Engine Lamp Off Value	0x1f1	497	Value	1	Temperature threshold to switch off engine lamp
Fan Key-On Off Temperature	0x1f2	498	Value	1	Temperature threshold to switch off fan
Fan Key-On On Temperature	0x1f3	499	Value	1	Temperature threshold to switch on fan
Fan Key-On Duty Cycle	0x1f4	500	Table	8	Fan key-on duty cycle
Fan Duty Cycle Frequency	0x1fc	508	Value	1	Fan duty cycle PWM frequency
VS-RPM Ratio VS Sampling Time	0x1fd	509	Value	1	Time to count speed sensor pulses
Fan Key-Off Run Delay	0x1fe	510	Value	1	Key-off delay before starting fan
Fan Key-Off Run Duty Cycle	0x1ff	511	Value	1	Fan duty cycle after key-off
Fan Key-Off On Temperature	0x200	512	Value	1	Key-off temperature threshold to switch off fan
Fan Key-Off Off Temperature	0x201	513	Value	1	Key-off temperature threshold to switch on fan

BUEIBxxx / B2RIBxxx / BUEICxxx					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Fan Key-Off Maximum Duration	0x202	514	Value	1	Maximum time running fan after key-off
Fan Key-Off Minimum Battery Voltage	0x203	515	Value	1	Minimum battery voltage to run fan after key-off
Active Muffler Configuration	0x204	516	Bits	1	Active Muffler Valve Configuration
Active Muffler WOT Condition Hysteresis	0x205	517	Value	1	Active exhaust valve WOT condition hysteresis
Active Muffler Motor Minimum On Time	0x206	518	Value	1	Active exhaust valve controller minimum on-time
Active Muffler Motor Minimum Off Time	0x207	519	Value	1	Active exhaust valve controller minimum off-time
Active Muffler Valve Switching Points	0x208	520	Array	6	Active exhaust valve switching RPMs
Rides Required to Clear DTC	0x20e	526	Value	1	Number of rides without error codes set to clear store errors
Throttle Position Sensor Number of Errors	0x20f	527	Value	1	Number of TPS read failures before error code is set
Throttle Position Sensor Highest Reading Allowed	0x210	528	Value	2	Maximum TPS reading
Throttle Position Sensor Lowest Reading Allowed	0x212	530	Value	2	Minimum TPS reading
Throttle Position Sensor Default Value	0x214	532	Value	2	TPS default value set on failure
O2 Sensor Test Minimum RPM	0x216	534	Value	2	Minimum RPM to check for O2 activity
O2 Sensor Test Minimum Throttle	0x218	536	Value	1	Minimum throttle to check for O2 activity
O2 Sensor Number of Errors	0x219	537	Value	1	Number of O2 sensor read failures before error code is set
O2 Sensor Number of Inactive Reads	0x21a	538	Value	1	Number of inactive results before error code is set
Engine Temperature Sensor Number of Errors	0x21b	539	Value	1	Number of ET sensor read failures before error code is set
Engine Temperature Sensor Highest Reading Allowed	0x21c	540	Value	1	Maximum ET sensor reading
Engine Temperature Sensor Lowest Reading Allowed	0x21d	541	Value	1	Minimum ET sensor reading
Engine Temperature Sensor Default Value	0x21e	542	Value	1	ET sensor default value set on failure
Air Temperature Sensor Highest Reading Allowed	0x21f	543	Value	1	Maximum allowed air temperature sensor reading
Air Temperature Sensor Lowest Reading Allowed	0x220	544	Value	1	Minimum allowed air temperature sensor reading
Air Temperature Sensor Default Value	0x221	545	Value	1	Air temperature sensor default value, set on failure
Air Temperature Sensor Number of Errors	0x222	546	Value	1	Number of air temperature sensor test failures before error code is set
Battery Voltage Number of Errors	0x223	547	Value	1	Number of battery voltage test failures before error code is set
Battery Voltage Highest Reading Allowed	0x224	548	Value	2	Battery voltage maximum reading allowed
Battery Voltage Lowest Reading Allowed	0x226	550	Value	2	Battery voltage minimum reading allowed
Battery Voltage Default Value	0x228	552	Value	2	Battery voltage default value, set on failure
Active Muffler Controller Number of Tests Failed	0x22a	554	Value	1	Number of AMC test failures before error code is set
Active Muffler Controller Max Feedback Time	0x22b	555	Value	1	Maximum time allowed for AMC feedback
Active Intake Throttle Threshold	0x22c	556	Value	1	Maximum TPS reading while AIC is active
Active Intake Error Counts	0x22d	557	Value	1	Number of failed active intake tests before setting an error code
Injector Feedback Highest Reading Allowed	0x22e	558	Value	1	Maximum injector feedback reading
Injector Feedback Lowest Reading Allowed	0x22f	559	Value	1	Minimum injector feedback reading

BUEIBxxx / B2RIBxxx / BUEICxxx					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Injector Feedback Number of Errors	0x230	560	Value	1	Number of injector feedback test failures before error code is set
Coil Feedback Highest Reading Allowed	0x231	561	Value	1	Maximum allowed coil feedback reading
Coil Feedback Lowest Reading Allowed	0x232	562	Value	1	Minimum allowed coil feedback reading
Coil Feedback Number of Errors	0x233	563	Value	1	Number of failed coil feedback tests before error code is set
Fuel Pump Feedback Upper Limit	0x234	564	Value	1	Maximum fuelpump feedback reading
Fuel Pump Feedback Off Time before Test	0x235	565	Value	1	Off time before fuel pump feedback checked
Fuel Pump Feedback Number of Errors	0x236	566	Value	1	Number of fuelpump feedback test failures before error code is set
Tacho Feedback Number of Errors	0x237	567	Value	1	Number of tacho feedback test failures before error code is set
Fan Feedback Upper Limit	0x238	568	Value	1	Maximum fan feedback reading
Fan Feedback Off Time before Test	0x239	569	Value	1	Fan off-time before running feedback test
Fan Feedback Number of Errors	0x23a	570	Value	1	Number of failed fan tests before error code is set
Bank Angle Sensor Highest Reading Allowed	0x23b	571	Value	1	Maximum bank angle sensor reading allowed (also: shifter configuration)
Bank Angle Sensor Tip-Over Value	0x23c	572	Value	1	Bank angle sensor tip-over value (also: shifter minimum delay between activations)
Bank Angle Sensor Lowest Reading Allowed	0x23d	573	Value	1	Minimum bank angles sensor reading allowed (also: shifter debounce period)
Bank Angle Sensor Number of Errors	0x23e	574	Value	1	Number of bank angle sensor test failures before error code is set (also: shifter fuel cut duration)
Bank Angle Sensor Tipover Delay	0x23f	575	Value	1	Bank angle sensor tip-over detection delay (also: shifter maximum input activation value)
EEPROM Test Number of Errors	0x240	576	Value	1	Number of failed EEPROM checksum tests before error code set
AD-Converter Number of Errors	0x241	577	Value	1	Number of failed A/D conversion tests before error code set
Camshaft Sensor Number of Sync Errors	0x242	578	Value	1	Number of revs without sync detected before error code set
Camshaft Sensor Test Number of Consecutive Sync Errors	0x243	579	Value	1	Number of consecutive out-of-sync revs before error code set
Error Mask Byte 0	0x244	580	Bits	1	Diagnostic trouble code mask, byte 0
Error Mask Byte 1	0x245	581	Bits	1	Diagnostic trouble code mask, byte 1
Error Mask Byte 2	0x246	582	Bits	1	Diagnostic trouble code mask, byte 2
Error Mask Byte 3	0x247	583	Bits	1	Diagnostic trouble code mask, byte 3
Error Mask Byte 4	0x248	584	Bits	1	Diagnostic trouble code mask, byte 4
Dwell Duration	0x249	585	Array	17	Dwell duration table
Timing Table Load Axis	0x25a	602	Axis	10	Timing table load axis (y-axis)
Timing Table RPM Axis	0x264	612	Axis	20	Timing table RPM axis (x-axis)
Fuel Map Load Axis	0x278	632	Axis	12	Fuel load axis
Fuel Map RPM Axis	0x284	644	Axis	26	Fuel RPM axis
Timing Table Front	0x29e	670	Map	100	Timing table front cylinder
Timing Table Rear	0x302	770	Map	100	Timing table rear cylinder
Fuel Map Front	0x366	870	Map	168	Front fuel table
Fuel Map Rear	0x40e	1038	Map	168	Fuel map rear cylinder

20.5 BUEYD (DDFI-3)

BUEYD (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
AFV Front	0xffffffea	-22	Value	2	Adaptive fuel value front cylinder
IAC Average Position	0xffffffed	-19	Value	1	Average IAC position when PID control is active
Active Intake Actuations	0xffffffee	-18	Value	2	Count of Active Intake actuations since cleared
AMC Key-On Status	0xfffffff6	-10	Bits	1	AMC status when ignition is switched on
Baro Pressure Sensor Stored Value	0xfffffff8	-8	Value	1	Stored barometric sensor reading
Stored Error Byte 0	0xfffffff9	-7	Bits	1	Stored (historic) trouble codes, byte 0
Stored Error Byte 1	0xfffffffa	-6	Bits	1	Stored (historic) trouble codes, byte 1
Stored Error Byte 2	0xfffffffb	-5	Bits	1	Stored (historic) trouble codes, byte 2
Stored Error Byte 3	0xfffffffc	-4	Bits	1	Stored (historic) trouble codes, byte 3
Stored Error Byte 4	0xfffffffd	-3	Bits	1	Stored (historic) trouble codes, byte 4
Stored Error Byte 5	0xfffffffe	-2	Bits	1	Stored (historic) trouble codes, byte 5
Stored Error Byte 6	0xffffffff	-1	Bits	1	Stored (historic) trouble codes, byte 6
Stored Error Byte 7	0x0	0	Bits	1	Stored (historic) trouble codes, byte 7
Stored Error Byte 8	0x1	1	Bits	1	Stored (historic) trouble codes, byte 8
Stored Error Byte 9	0x2	2	Bits	1	Stored (historic) trouble codes, byte 9
Stored Error Byte 10	0x3	3	Bits	1	Stored (historic) trouble codes, byte 10
Number of Rides since Error Set	0x4	4	Value	1	Number of rides since a trouble code was set
Calibration ID	0x5	5	Value	1	Country specific calibration identifier
AFV Rear	0x6	6	Value	2	Adaptive fuel value rear cylinder
System Configuration	0x8	8	Bits	1	Global ECM setup
Layout Revision	0x9	9	Value	1	Cal Structure Revision (read only)
Engine Running RPM Hysteresis High Value	0xe	14	Value	2	Upper engine running threshold
Engine Running RPM Hysteresis Low Value	0x10	16	Value	2	Lower engine running threshold
Throttle Position Sensor Reset Voltage	0x12	18	Value	2	TPS voltage with a fully closde throttle, written on a TPS reset
Throttle Position Sensor Voltage Range	0x14	20	Value	2	TPS voltage difference from fully closed to WOT
Throttle Position Sensor Degrees Range	0x16	22	Value	2	TPS degrees difference from fully closed to WOT
Throttle Position Sensor Moving Average Fraction	0x18	24	Value	1	TPS fraction used to detect TP changes
O2 Sensor Rich Voltage	0x1e	30	Value	1	O2 sensor voltage indicating a rich mixture
O2 Sensor Lean Voltage	0x1f	31	Value	1	O2 sensor voltage indicating a lean mixture
Closed Loop Feature Minimum RPM	0x20	32	Value	1	Minimum RPM to activate O2 sensor
Closed Loop Feature Minimum Throttle	0x21	33	Value	1	Minimum throttle to activate O2 sensor
O2 Sensor Activation Time	0x22	34	Value	1	O2 sensor activation delay
O2 Sensor Deactivation Time	0x23	35	Value	1	O2 sensor deactivation delay
Calibration String	0x24	36	String	8	Country version identifier
Startup Fuel Pulsewidth	0x24	36	Table	6	Starting fuel pulse length
Pre Sync Fuel Maximum Engine Temperature	0x2a	42	Value	1	Max engine temp for pre-sync fuel pulses
Post Sync Fuel Maximum Engine Temperature	0x2b	43	Value	1	Max engine temp for post-sync fuel pulses
Fuel Pump Duty Cycle Table	0x2c	44	Table	6	Fuel pump duty cycle table
Fuel Pump Frequency	0x32	50	Value	1	Fuel pump PWM frequency
AD-Converter Input Select	0x33	51	Value	1	Analog-digital conversion input

BUEYD (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
MAP Sensor Front Reading Position	0x34	52	Value	1	Crankshaft position to read front MAP sensor
MAP Sensor Rear Reading Position	0x35	53	Value	1	Crankshaft position to read rear MAP sensor
TPS-MAP Load Configuration	0x36	54	Bits	1	Throttle Map Load Configuration
Live Log Configuration	0x38	56	Bits	1	Live Log Configuration
Global Fuel Correction	0x3a	58	Value	1	Global fuel correction factor, applied to all map regions
Acceleration Enrichment Configuration	0x3b	59	Bits	1	Acceleration Enrichment Configuration
Acceleration Enrichment Front Pulse Start	0x3d	61	Value	1	Camshaft or crankshaft position to start late acceleration pulse for the front cylinder
Acceleration Enrichment Rear Pulse Start	0x3e	62	Value	1	Camshaft or crankshaft position to start late acceleration pulse for the rear cylinder
Light Acceleration Condition	0x3f	63	Value	1	TPS change indicating a light accel. condition
Full Acceleration Condition	0x40	64	Value	1	Change in throttle movement indicationg a full acceleration condition
Acceleration Enrichment Duration	0x41	65	Value	1	Full acceleration enrichment duration in engine revs
Acceleration Enrichment Region	0x42	66	Table	4	Acceleration enrichment region
Acceleration Enrichment Temperature Adjustment	0x46	70	Table	8	Acceleration enrichment adjustment on engine temperature
Acceleration Enrichment	0x4e	78	Table	8	Acceleration enrichment
Deceleration Correction Region	0x56	86	Table	8	Deceleration correction region
Deceleration Correction	0x5e	94	Value	1	Deceleration correction
Deceleration Condition Hysteresis	0x5f	95	Value	1	Deceleration condition throttle hysteresis
Throttle Roll-Off Condition	0x60	96	Value	1	Throttle roll-off condition
Throttle Roll-Off Correction	0x61	97	Value	1	Throttle roll-off fuel correction
Fuel Cut Region	0x62	98	Table	4	Fuel cut region
Deceleration Learn Maximum RPM	0x66	102	Value	1	Deceleration learn mode maximum RPM
Deceleration Learn Minimum RPM	0x67	103	Value	1	Deceleration learn mode minimum RPM
Deceleration Learn Minimum Duration	0x68	104	Value	1	Engine revs for deceleration learn mode
Deceleration Learn Minimum Readings	0x69	105	Value	1	Number of consecutive rich O2 readings required
WOT Region	0x6a	106	Table	4	Wide-Open Throttle definition
WOT Enrichment	0x6e	110	Value	2	Default fuel correction, applied to WOT regions
Idle Correction	0x70	112	Table	8	Idle correction
Idle Maxiumum Engine Speed	0x78	120	Value	2	Idle region maximum RPM
Idle Maxiumum Load	0x7a	122	Value	1	Idle region maximum throttle
Open Loop Enrichment Delay	0x7b	123	Value	1	Time before increasing AFV
Startup Enrichment Temperature Axis	0x7c	124	Axis	4	Startup condition temperature axis
Startup Enrichment	0x80	128	Table	4	Fuell correction after egine startup
Startup Enrichment Duration	0x84	132	Table	4	Duration of startup fuel enrichment
Open Loop Default Correction	0x88	136	Value	2	Default fuel correction, applied to open loop regions
Front Cylinder Correction	0x8a	138	Table	8	Front cylinder fuel enrichment on engine temperature
Warmup Enrichment	0x92	146	Table	28	Engine Temp fuel correction
Hot Start Condition	0xae	174	Value	2	Engine temperature indicating a hot start condition
Engine Temperature Sensor Conversion Data	0xb0	176	Table	28	Engine temperature senor data
Air Temperature Correction	0xcc	204	Table	14	Air Temp correction
Air Temperature Sensor Data	0xda	218	Table	28	Air temperature sensor data
Battery Voltage Correction	0xf6	246	Table	12	Battery voltage correction
2nd Battery Voltage Correction	0x102	258	Table	12	Battery correction for showerheads

BUEYD (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Barometric Pressure Sensor Reading Configuration	0x10e	270	Bits	1	Barometric pressure sensor access setup
Baro Pressure Sensor Delay	0x10f	271	Value	1	Delay before reading barometric pressure sensor when switching on ignition
Barometric Feature Region	0x110	272	Table	8	Barometric feature region lower boundary
MAP Barometric Correction	0x118	280	Table	8	Baro adjustment of MAP reads
Baro Pressure Sensor Moving Average Factor	0x120	288	Value	1	Baro Pressure Sensor Moving Average Factor
Airbox Pressure Configuration	0x121	289	Bits	1	Air pressure sensor configuration byte
Barometric Pressure Key-On Minimum Value	0x122	290	Value	1	Minimum valid barometric pressure sensor reading when switching on ignition
Barometric Pressure Key-On Maximum Value	0x123	291	Value	1	Maximum valid barometric pressure sensor reading when switching on ignition
Airbox Pressure Sensor Data	0x124	292	Table	14	Air Box Pressure conversion
Baro Correction	0x132	306	Table	14	Baro pressure correction
Vehicle Speed Correction	0x140	320	Table	16	Airbox pressure correction for speed
Airbox Pressure Correction	0x150	336	Table	16	Airbox pressure correction
Calibration Mode Number of Readings	0x161	353	Value	1	Number of O2 sensor readings required to adjust AFV
Closed Loop Region Upper Boundary	0x162	354	Table	8	Closed loop upper boundary
Closed Loop Region Lower Boundary	0x16a	362	Table	18	Closed loop lower boundary
Closed Loop Upper Boundary Load Hysteresis	0x17c	380	Value	1	Upper closed loop boundary hysteresis, TPP
Closed Loop Lower Boundary Load Hysteresis	0x17d	381	Value	1	Lower closed loop boundary hysteresis, TPP
Closed Loop Upper Boundary RPM Hysteresis	0x17e	382	Value	2	Closed loop upper boundary RPM hysteresis
Closed Loop Lower Boundary RPM Hysteresis	0x180	384	Value	2	Closed loop lower boundary RPM hysteresis
EGO Correction Maximum Value	0x182	386	Value	2	Maximum closed loop EGO correction
EGO Correction Minimum Value	0x184	388	Value	2	Minimum closed loop EGO correction
Closed Loop Maximum Engine Temperature	0x186	390	Value	2	Maximum engine temperature to activate closed loop
Closed Loop Minimum Engine Temperature	0x188	392	Value	2	Minimum engine temperature to activate closed loop
Closed Loop Lower Boundary Adjustment Value	0x18a	394	Value	1	Lower closed loop region boundary adjustment value
Closed Loop Lower Boundary Adjustment Highest Gear	0x18b	395	Value	1	Highest gear where lower closed loop region boundary is adjusted
AFV Maximum Value	0x18c	396	Value	2	Maximum allowed AFV
AFV Minimum Value	0x18e	398	Value	2	Minimum allowed AFV
AFV Increase Factor	0x190	400	Value	2	Factor applied to increase AFV
AFV Decrease Factor	0x192	402	Value	2	Factor applied to decrease AFV
Calibration Mode Maximum Engine Temperature	0x194	404	Value	2	Maximum engine temperature to enable calibration mode
Calibration Mode Minimum Engine Temperature	0x196	406	Value	2	Minimum engine temperature to enable calibration mode
Calibration Mode Region Upper Boundary	0x198	408	Table	8	Calibration mode region upper boundary
Calibration Mode Region Lower Boundary	0x1a0	416	Table	14	Calibration mode region lower boundary
Altitude Adjustement Lower Boundary	0x1ae	430	Table	6	Altitude adjustment lower boundary
Altitude Adjustment Upper Boundary	0x1b4	436	Table	6	Altitude adjustment upper boundary
Fuel PI Controller Low RPM Threshold	0x1ba	442	Value	1	PI controller low value RPM limit

BUEYD (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Fuel PI Controller Low Load Threshold	0x1bb	443	Value	1	PI controller low value load limit
Fuel PI Controller High RPM Threshold	0x1bc	444	Value	1	PI controller high value RPM limit
Fuel PI Controller High Load Threshold	0x1bd	445	Value	1	PI controller high value load limit
O2 Sensor Target Voltage Array	0x1be	446	Array	4	O2 midpoint for idle, lo, mid and hi
Fuel PI Controller P-Value Table Front when Rich	0x1c2	450	Array	4	Proportional values for the front cylinder and rich transition (idle, low, mid, high)
Fuel PI Controller I-Value Table Front when Rich	0x1c6	454	Array	4	Integral values for the front cylinder and rich mixture (idle, low, mid, high)
Fuel PI Controller P-Value Table Front when Lean	0x1ca	458	Array	4	Proportional values for the front cylinder and lean transition (idle, low, mid, high)
Fuel PI Controller I-Value Table Front when Lean	0x1ce	462	Array	4	Integral values for the front cylinder and lean mixture (idle, low, mid, high)
Fuel PI Controller P-Value Table Rear when Rich	0x1d2	466	Array	4	Proportional values for the rear cylinder and rich transition (idle, low, mid, high)
Fuel PI Controller I-Value Table Rear when Rich	0x1d6	470	Array	4	Integral values for the rear cylinder and rich mixture (idle, low, mid, high)
Fuel PI Controller P-Value Table Rear when Lean	0x1da	474	Array	4	Proportional values for the rear cylinder and lean transition (idle, low, mid, high)
Fuel PI Controller I-Value Table Rear when Lean	0x1de	478	Array	4	Integral values for the rear cylinder and lean mixture (idle, low, mid, high)
Fuel Pulse Endpoint Table for Engine Temperature	0x1e8	488	Table	6	Fuel pulse endpoint temperature correction
Fuel Pulse Endpoint Table for Load	0x1ee	494	Table	6	Fuel pulse endpoint throttle correction
2nd Fuel Puls Endpoint Temperature Correction	0x1f4	500	Table	6	Showerhead pulse end point, ET based
2nd Fuel Pulse Endpoint Throttle Correction	0x1fa	506	Table	6	Showerhead pulse end point, load based
Table Lock Value	0x200	512	Value	2	
AFV Storage Delay	0x202	514	Value	1	Time between AFV writes to EEPROM
Global Spark Advance	0x203	515	Value	1	Global spark advance adjustment
Timed Spark Adjust Minimum RPM	0x204	516	Value	2	Minimum RPM to enable spark advance adjusting
Idle Spark Advance Temperature Adjustment	0x206	518	Table	8	Idle spark advance temperature correction
WOT Spark Advance Reduction	0x20e	526	Table	8	WOT spark advance reduction
Air Temperature Spark Retard Configuration	0x216	534	Bits	1	Air Temp Retard Configuration
Air Temperature Spark Advance Reduction Scaling	0x218	536	Table	14	Air temp spark retard
VSS Input Test Minimum Load	0x227	551	Value	1	Minimum load for VS input diagnostic
VSS Input Minimum Frequency	0x228	552	Value	1	Minimum valid VSS input frequency
VSS Output Test Timeout	0x22a	554	Value	1	Vehicle Speed Ouptut diagnostic timeout
VSS Input Scaling Factor	0x22c	556	Value	2	Scale factor for VSS input
VS-RPM Ratio VS Sampling Time	0x22d	557	Value	1	Time to count speed sensor pulses
VSS Ratio Gearing Table	0x22e	558	Array	6	Gear selection
Spark Advance Retard Configuration	0x234	564	Bits	1	Spark advance and fuel reduction configuration
Spark Advance Retard Minimum Engine Temperature	0x235	565	Value	1	Minimum engine temperature to enable reduction
Spark Advance Reduction Upper RPM Boundary	0x236	566	Array	7	Maximum RPM to enable reduction
Spark Advance Reduction Lower RPM boundary	0x23d	573	Array	7	Minimum RPM to enable reduction
Spark Advance Reduction Fuel Correction	0x244	580	Array	7	Fuel correction during activation

BUEYD (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Spark Advance Reduction	0x24b	587	Array	7	The spark advance reduction while noise abatement is active
Spark Advance Reduction Ramp-In Duration	0x252	594	Array	7	Spark advance reduction ramp-in duration
Spark Advance Reduction Hold Duration	0x259	601	Array	7	Spark advance reduction hold duration
Spark Advance Reduction Ramp-Out Duration	0x260	608	Array	7	Spark advance reduction ramp-out duration
Active Intake Configuration	0x267	615	Bits	1	Active intake controller setup
Active Intake Gearing	0x268	616	Bits	1	Active intake gearing configuration byte
Active Intake Period	0x269	617	Value	1	Active intake control period
Active Intake Ramp In Duty Cycle	0x26a	618	Value	1	Active intake ramp-in period duty cycle
Active Intake Hold Duty Cycle	0x26b	619	Value	1	Active intake hold period duty cycle
Active Intake Ramp Out Duty Cycle	0x26c	620	Value	1	Active intake ramp-out period duty cycle
Fuel and Spark Skip Configuation	0x26d	621	Bits	1	Fuel and Spark Skip Configuation
RPM Fixed Limit Cold Start Ramp	0x26e	622	Value	1	Temperature delta to ramp from cold RPM limits
Soft Limit Ignition Pattern Front	0x26f	623	Bits	1	Front Soft Limit Fire Pattern
Soft Limit Ignition Pattern Rear	0x270	624	Bits	1	Rear Soft Limit Fire Pattern
Hard Limit Ignition Pattern Front	0x271	625	Bits	1	Front Hard Limit Fire Pattern
Hard Limit Ignition Pattern Rear	0x272	626	Bits	1	Rear Hard Limit Fire Pattern
RPM Fixed Soft Limit Trigger for Cold Engine	0x273	627	Value	1	Cold engine soft RPM limit, high
RPM Fixed Soft Limit Recharge for Cold Engine	0x274	628	Value	1	Cold engine soft RPM limit, low
RPM Fixed Hard Limit Trigger for Cold Engine	0x275	629	Value	1	Cold engine hard RPM limit, high
RPM Fixed Hard Limit Recharge for Cold Engine	0x276	630	Value	1	Cold engine hard RPM limit, low
RPM Fixed Soft Limit Trigger	0x277	631	Value	1	Fixed soft limit trigger RPM
RPM Fixed Soft Limit Recharge	0x278	632	Value	1	Fixed soft limit release RPM
RPM Fixed Hard Limit Trigger	0x279	633	Value	1	Fixed hard limit trigger RPM
RPM Fixed Hard Limit Recharge	0x27a	634	Value	1	Fixed hard limit release RPM
RPM Fixed Kill Limit Trigger	0x27b	635	Value	1	Kill limit trigger RPM
RPM Fixed Kill Limit Recharge	0x27c	636	Value	1	Kill limit release RPM
RPM High Speed Hysteresis High Value	0x27d	637	Value	1	High speed speed-RPM ration hysteresis, upper value
RPM High Speed Hysteresis Low Value	0x27e	638	Value	1	High speed speed-RPM ration hysteresis, lower value
RPM High Speed Timed Limit Timer Start	0x27f	639	Value	1	RPM threshold to start limit timer at high speed
RPM High Speed Timed Limit Timer Reset	0x280	640	Value	1	RPM threshold to reset limit timer at high speed
RPM High Speed Timed Hard Limit	0x281	641	Value	1	RPM threshold to enable delayed hard limit at high speed
RPM High Speed Timed Soft Limit	0x282	642	Value	1	RPM threshold to enable delayed soft limit at high speed
RPM High Speed Timed Soft Limit Delay	0x283	643	Value	1	Soft limit delay at high speed
RPM High Speed Timed Hard Limit Delay	0x284	644	Value	1	Hard limit delay at high speed
RPM Low Speed Timed Limit Timer Start	0x285	645	Value	1	RPM threshold to start limit timer at low speed
RPM Low Speed Timed Limit Timer Reset	0x286	646	Value	1	RPM threshold to reset limit timer at low speed
RPM Low Speed Timed Hard Limit	0x287	647	Value	1	RPM threshold to enable delayed hard limit at low speed

BUEYD (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
RPM Low Speed Timed Soft Limit	0x288	648	Value	1	RPM threshold to enable delayed soft limit at low speed
RPM Low Speed Timed Soft Limit Delay	0x289	649	Value	1	Soft limit delay at low speed
RPM Low Speed Timed Hard Limit Delay	0x28a	650	Value	1	Hard limit delay at low speed
Temperature Soft Limit Minimum Load	0x28b	651	Value	1	Load above which soft temp limit enabled
Temperature Soft Limit Minimum RPM	0x28c	652	Value	1	Minimum RPM to enable temperature soft limit
Temperature Hard Limit Minimum Load	0x28d	653	Value	1	Load above which hard temp limit enabled
Temperature Hard Limit Minimum RPM	0x28e	654	Value	1	Minimum RPM to enable temperature hard limit
Temperature Soft Limit Trigger	0x28f	655	Value	1	Temperature threshold to trigger soft limit
Temperature Soft Limit Recharge	0x290	656	Value	1	Temperature threshold to recharge soft limit
Temperature Hard Limit Trigger	0x291	657	Value	1	Temperature trheshold to trigger hard limit
Temperature Hard Limit Recharge	0x292	658	Value	1	Temperature threshold to recharge hard limit
Ignore Minimum RPM Trigger	0x293	659	Value	1	Temperature threshold indicating to ignore RPM/throttle limits
Ignore Minimum RPM Recharge	0x294	660	Value	1	Temperature threshold indicating to obey RPM/throttle limits
Temperature Kill Limit Trigger	0x295	661	Value	1	Temperature trheshold to trigger hard limit
Temperature Kill Limit Recharge	0x296	662	Value	1	Temperature threshold to recharge kill limit
Temperature Limit Engine Lamp On Value	0x297	663	Value	1	Temperature threshold to switch on engine lamp
Temperature Limit Engine Lamp Off Value	0x298	664	Value	1	Temperature threshold to switch off engine lamp
Fan Configuration	0x299	665	Bits	1	Fan Configuration
Fan Key-On Off Temperature	0x29a	666	Value	1	Temperature threshold to switch off fan
Fan Key-On On Temperature	0x29b	667	Value	1	Temperature threshold to switch on fan
Fan Key-On Duty Cycle	0x29c	668	Table	8	Fan key-on duty cycle
Fan Duty Cycle Period	0x2a4	676	Value	1	Cooling Fan Control Period
Fan Key-Off Run Delay	0x2a5	677	Value	1	Key-off delay before starting fan
Fan Key-Off Run Duty Cycle	0x2a6	678	Value	1	Fan duty cycle after key-off
Fan Key-Off On Temperature	0x2a7	679	Value	1	Key-off temperature threshold to switch off fan
Fan Key-Off Off Temperature	0x2a8	680	Value	1	Key-off temperature threshold to switch on fan
Fan Key-Off Maximum Duration	0x2a9	681	Value	1	Maximum time running fan after key-off
Fan Key-Off Minimum Battery Voltage	0x2aa	682	Value	1	Minimum battery voltage to run fan after key-off
Fan 2 Delay	0x2ab	683	Value	1	Delay before switching on fan 2 after turning on fan 1
Active Muffler Configuration	0x2ac	684	Bits	1	Active Muffler Valve Configuration
Active Muffler WOT Condition Hysteresis	0x2ad	685	Value	1	Active exhaust valve WOT condition hysteresis
Active Muffler Motor Minimum On Time	0x2ae	686	Value	1	Active exhaust valve controller minimum on-time
Active Muffler Motor Minimum Off Time	0x2af	687	Value	1	Active exhaust valve controller minimum off-time
Active Muffler Valve Switching Points	0x2b0	688	Array	6	Active exhaust valve switching RPMs
Shifter Configuration	0x2f0	752	Bits	1	Shifter Configuration
Shifter Input	0x2f1	753	Value	1	Input pin to activate shifter feature
Shifter Input Activation Level	0x2f2	754	Value	1	Shifter feature activation level
Shifter Input Debounce Time	0x2f3	755	Value	1	Shifter feature debounce time
Shifter Input Minimum Delay	0x2f4	756	Value	1	Min time between shifts
Shifter Interrupt Duration	0x2f5	757	Array	7	Length of shift interrupt

BUEYD (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Shift Light Configuration	0x2fc	764	Bits	1	Shift Light Configuration
Shift Light Flashing Period	0x2fd	765	Value	1	Shift light on time while flashing
Shift Light Flashing RPM Hysteresis High	0x2fe	766	Array	7	Shift Light flashing above this speed
Shift Light Flashing RPM Hysteresis Low	0x305	773	Array	7	Shift Light stops flashing below this speed
Shift Light On RPM Hysteresis High	0x30c	780	Array	7	Shift Light on above this speed
Shift Light Off RPM Hysteresis Low	0x313	787	Array	7	Shift Light off below this speed
Starter Interlock Configuration	0x31a	794	Bits	1	Starter Interlock Configuration
Sidestand Interlock Signal Threshold	0x31b	795	Value	1	Threshold for sidestand input
Starter Relay Maximum RPM Hysteresis High	0x31c	796	Value	1	Max RPM for starter relay (upper hysteresis)
Starter Relay Maximum RPM Hysteresis Low	0x31d	797	Value	1	Max RPM for starter relay (lower hysteresis)
Sidestand Interlock Maximum Speed	0x31e	798	Value	1	Sidestand interlock disabled after reaching speed
Sidestand Input Number of Errors	0x31f	799	Value	1	Sidestand extended at high speed before failure
Sidestand Input Maximum Reading Allowed	0x320	800	Value	1	Upper limit of sidestand input
Sidestand Input Minimum Reading Allowed	0x321	801	Value	1	Lower limit of sidestand input
Idle Air Control Configuration	0x322	802	Bits	1	Idle air control setup
Idle Air Control Average Maximum Value	0x332	818	Value	1	Maximum value for idle air control moving average
Idle Air Control Average Minimum Value	0x333	819	Value	1	Minimum value for idle air control moving average
Idle Air Control Moving Average Factor	0x336	822	Value	1	Idle air control factor to set up moving average
Idle Air Control Average Maxiumum Engine Temperature	0x337	823	Value	1	Maximum engine temperature for idle air control moving average
Idle Air Control Average Minimum Engine Temperature	0x338	824	Value	1	Minimum engine temperature for idle air control moving average
Idle Air Control Key-On Position	0x360	864	Table	8	IAC position for startup
Idle Air Control Startup Correction	0x374	884	Table	4	IAC RPM setpoint correction for startup
Idle Air Control Throttle Position Adjustment	0x378	888	Table	16	Throttle position adjustment table for IAC position
Idle Air Control TP Adjustment Scaling	0x388	904	Table	16	Scaling of IAC throttle position adjustment for throttle position load
CAN Bus Configuration	0x3a2	930	Bits	1	CAN bus setup
Global Fuel Scale Increment	0x3a4	932	Value	1	Incremental Fuel scale, time per unit of fuel
Cold Start Condition	0x3a9	937	Value	1	Engine temperature indicates a cold engine condition. The CAN cold flag is set and cold engine RPM limit apply.
Aux Power Relay Configuration	0x3c2	962	Bits	1	Aux Power Relay Configuration
Aux Power Relay On Battery Voltage	0x3c3	963	Value	1	Battery voltage above which aux relay turned on
Aux Power Relay Off Battery Voltage	0x3c4	964	Value	1	Battery voltage below which aux relay turned off
Aux Power Relay Switching Delay	0x3c5	965	Value	1	Delay before switching aux relay
Spark Plug Cleaning Configuration	0x3c6	966	Bits	1	Spark Plug Cleaning Configuration
Spark Plug Cleaning Maximum Engine Temperature	0x3c8	968	Value	1	No plug cleaning needed if TE exceeds this
Spark Plug Cleaning Waste Fire Maximum Engine Temperature	0x3c9	969	Value	1	Terminate plug cleaning waste fires above this TE

BUEYD (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Spark Plug Cleaning Engine Minimum Run Time	0x3ca	970	Value	1	Min time for engine run event for plug cleaning
Spark Plug Cleaning Number of Cold Runs	0x3cb	971	Value	1	Cold run events before plug cleaning needed
Spark Plug Key-On Cleaning Time	0x3cd	973	Value	1	Duration of key-on plug cleaning
Spark Plug Cleaning Number of Waste Fires	0x3ce	974	Value	1	Plug cleaning waste fires per rev
Fuel Pressure Control Configuration	0x3d2	978	Bits	1	Fuel Pressure Control Configuration
Fuel Pressure Key-Off Minimum Pressure	0x3e8	1000	Table	6	Minimum fuel pressure when engine off
Fuel Pressure Setpoint for Startup	0x3f6	1014	Table	4	Fuel Pressure setpoint at startup
Fuel Pressure Setpoint for Engine Temperature	0x3fa	1018	Table	28	Fuel pressure setpoint table for engine temperature
Fuel Pressure Sensor Conversion Table	0x416	1046	Table	28	Fuel pressure sensor data
Fuel Pressure Setpoint Load Axis	0x432	1074	Axis	6	Load axis for fuel pressure setpoint map
Fuel Pressure Setpoint RPM Axis	0x438	1080	Axis	12	RPM axis for fuel pressure setpoint map
Fuel Pressure Setpoint	0x444	1092	Map	36	Fuel pressure setpoint map for RPM and load
Voltage and Fuel Pressure Correction Temperature Axis	0x468	1128	Axis	6	Fuel pressure axis for voltage and fuel pressure correction map
Voltage and Fuel Pressure Correction Battery Axis	0x46e	1134	Axis	12	Battery axis for voltage and fuel pressure correction map
Voltage and Fuel Pressure Correction	0x47a	1146	Map	36	Injector adder based on fuel pressure and battery
Fuel Pressure Correction	0x49e	1182	Table	8	Fuel Pressure correction
Fuel Pulse Endpoint Load Axis	0x4a6	1190	Axis	6	Fuel endpoint load axis
Fuel Pulse Endpoint RPM Axis	0x4ac	1196	Axis	12	Fuel endpoint RPM axis
Fuel Pulse Endpoint Table	0x4b8	1208	Map	36	Fuel endpoint speed/load table
Rides Required to Clear DTC	0x4dc	1244	Value	1	Number of rides without error codes set to clear store errors
Throttle Position Sensor Number of Errors	0x4dd	1245	Value	1	Number of TPS read failures before error code is set
Throttle Position Sensor Highest Reading Allowed	0x4de	1246	Value	2	Maximum TPS reading
Throttle Position Sensor Lowest Reading Allowed	0x4e0	1248	Value	2	Minimum TPS reading
Throttle Position Sensor Default Value	0x4e2	1250	Value	2	TPS default value set on failure
O2 Sensor Test Minimum RPM	0x4e4	1252	Value	2	Minimum RPM to check for O2 activity
O2 Sensor Test Minimum Throttle	0x4e6	1254	Value	1	Minimum throttle to check for O2 activity
O2 Sensor Number of Errors	0x4e7	1255	Value	1	Number of O2 sensor read failures before error code is set
O2 Sensor Number of Inactive Reads	0x4e8	1256	Value	1	Number of inactive results before error code is set
Engine Temperature Sensor Number of Errors	0x4e9	1257	Value	1	Number of ET sensor read failures before error code is set
Engine Temperature Sensor Highest Reading Allowed	0x4ea	1258	Value	1	Maximum ET sensor reading
Engine Temperature Sensor Lowest Reading Allowed	0x4eb	1259	Value	1	Minimum ET sensor reading
Engine Temperature Sensor Default Value	0x4ec	1260	Value	1	ET sensor default value set on failure
Air Temperature Sensor Highest Reading Allowed	0x4ed	1261	Value	1	Maximum allowed air temperature sensor reading
Air Temperature Sensor Lowest Reading Allowed	0x4ee	1262	Value	1	Minimum allowed air temperature sensor reading
Air Temperature Sensor Default Value	0x4ef	1263	Value	1	Air temperature sensor default value, set on failure

BUEYD (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Air Temperature Sensor Number of Errors	0x4f0	1264	Value	1	Number of air temperature sensor test failures before error code is set
Battery Average Voltage Difference Limit	0x4f5	1269	Value	1	Maximum difference allowed between average high and low battery voltage
Battery Voltage Test Minimum RPM	0x4f6	1270	Value	1	Minimum engine speed to perform battery voltage tests
Battery Voltage Number of Errors	0x4f7	1271	Value	1	Number of battery voltage test failures before error code is set
Battery Voltage Highest Reading Allowed	0x4f8	1272	Value	2	Battery voltage maximum reading allowed
Battery Voltage Lowest Reading Allowed	0x4fa	1274	Value	2	Battery voltage minimum reading allowed
Battery Voltage Default Value	0x4fc	1276	Value	2	Battery voltage default value, set on failure
Active Muffler Controller Number of Tests Failed	0x4fe	1278	Value	1	Number of AMC test failures before error code is set
Active Muffler Controller Max Feedback Time	0x4ff	1279	Value	1	Maximum time allowed for AMC feedback
Active Intake Maximum TPS Reading Allowed	0x500	1280	Value	1	Maximum TPS reading while AIC is active
Active Intake Error Counts	0x501	1281	Value	1	Number of failed active intake tests before setting an error code
Active Intake Feedback Timeout	0x502	1282	Value	1	Active Intake Control feedback timeout
Injector Feedback Highest Reading Allowed	0x503	1283	Value	1	Maximum injector feedback reading
Injector Feedback Lowest Reading Allowed	0x504	1284	Value	1	Minimum injector feedback reading
Injector Feedback Number of Errors	0x505	1285	Value	1	Number of injector feedback test failures before error code is set
Coil Feedback Highest Reading Allowed	0x506	1286	Value	1	Maximum allowed coil feedback reading
Coil Feedback Lowest Reading Allowed	0x507	1287	Value	1	Minimum allowed coil feedback reading
Coil Feedback Number of Errors	0x508	1288	Value	1	Number of failed coil feedback tests before error code is set
Clutch Test Number of VSS Samples	0x509	1289	Value	1	Number of vehicle speed samples for clutch diagnostic tests
Clutch Test Minimum Load	0x50a	1290	Value	1	Minimum load to run clutch diagnostic tests
Clutch Test Timeout	0x50b	1291	Value	1	Number of failed clutch diagnostic tests before error code is set
Neutral Test Number of VSS Samples	0x50c	1292	Value	1	Number of vehicle speed samples for neutral diagnostic tests
Neutral Test Minimum Load	0x50d	1293	Value	1	Minimum load for neutral diagnostic
Neutral Test Timeout	0x50e	1294	Value	1	Neutral diagnostic timeout
Fuel Pump Feedback Upper Limit	0x50f	1295	Value	1	Maximum fuelpump feedback reading
Fuel Pump Feedback Off Time before Test	0x510	1296	Value	1	Off time before fuel pump feedback checked
Fuel Pump Feedback Number of Errors	0x511	1297	Value	1	Number of fuelpump feedback test failures before error code is set
Idle Air Control Position Test Maximum Engine Temperature	0x515	1301	Value	1	Maximum engine temperature to test idle air control position
Idle Air Control Position Test Limit High	0x516	1302	Value	1	IAC position high diagnostic limit (255 disables)
Idle Air Control Position Test Limit Low	0x517	1303	Value	1	IAC position low diagnostic limit
Idle Air Control Highest Reading Allowed	0x518	1304	Value	1	IAC high position limit
Idle Air Control Lowest Reading Allowed	0x519	1305	Value	1	IAC low position limit
Idle Air Control Position Test Timeout	0x51a	1306	Value	1	Idle air control position diagnostic timeout

BUEYD (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Idle Air Control Test Timeout	0x51b	1307	Value	1	IAC diagnostic timeout
Tacho Feedback Number of Errors	0x51c	1308	Value	1	Number of tacho feedback test failures before error code is set
Fan Feedback Off Time before Test	0x51d	1309	Value	1	Fan off-time before running feedback test
Fan Feedback Number of Errors	0x51e	1310	Value	1	Number of failed fan tests before error code is set
VSS Output Scaling Factor	0x520	1312	Value	2	Scale factor for VSS output
VSS Input Test Timeout	0x521	1313	Value	1	Vehicle Speed Input diagnostic timeout
VSS Input Test Minimum RPM	0x522	1314	Value	1	Minimum engine speed for VS input diagnostic
Bank Angle Sensor Highest Reading Allowed	0x525	1317	Value	1	Maximum bank angle sensor reading allowed (also: shifter configuration)
Bank Angle Sensor Tip-Over Value	0x526	1318	Value	1	Bank angle sensor tip-over value (also: shifter minimum delay between activations)
Bank Angle Sensor Lowest Reading Allowed	0x527	1319	Value	1	Minimum bank angles sensor reading allowed (also: shifter debounce period)
Bank Angle Sensor Number of Errors	0x528	1320	Value	1	Number of bank angle sensor test failures before error code is set (also: shifter fuel cut duration)
Bank Angle Sensor Tipover Delay	0x529	1321	Value	1	Bank angle sensor tip-over detection delay (also: shifter maximum input activation value)
Starter Relay Test Timeout	0x52a	1322	Value	1	Starter Relay diagnostic timeout
Aux Power Relay Test Feedback Timeout	0x52b	1323	Value	1	Auxiliary Power Relay diagnostic timeout
EEPROM Test Number of Errors	0x52c	1324	Value	1	Number of failed EEPROM checksum tests before error code set
AD-Converter Number of Errors	0x52d	1325	Value	1	Number of failed A/D conversion tests before error code set
Camshaft Sensor Test Minimum RPM	0x52e	1326	Value	2	Minimum RPM to set lost sync error
Camshaft Sensor Number of Sync Errors	0x530	1328	Value	1	Number of revs without sync detected before error code set
Camshaft Sensor Test Number of Consecutive Sync Errors	0x531	1329	Value	1	Number of consecutive out-of-sync revs before error code set
AFV Cylinder Difference Limit	0x535	1333	Value	1	Learned Fuel Cylinder Difference limit
AFV Cylinder Difference Number of Errors	0x536	1334	Value	1	Learned Fuel Cylinder Difference timeout
MAP Sensor Highest Reading Allowed	0x537	1335	Value	1	Highest MAP sensor reading allowed
MAP Sensor Lowest Reading Allowed	0x538	1336	Value	1	Lowest MAP sensor reading allowed
MAP Sensor Default Value	0x539	1337	Value	1	Default MAP value set on failure
Map Sensor Number of Errors	0x53a	1338	Value	1	Number of MAP sensor read failures before error code is set
Barometric Pressure Sensor Highest Reading Allowed	0x53b	1339	Value	1	Barometric pressure sensor maximum reading allowed
Barometric Pressure Sensor Lowest Reading Allowed	0x53c	1340	Value	1	Barometric pressure sensor mininmum reading allowed
Barometric Pressure Sensor Configuration	0x53d	1341	Value	1	Barometric pressure sensor default value, set on failure
Barometric Pressure Sensor Number of Errors	0x53e	1342	Value	1	Number of barometric pressure sensor test failures before error code is set
Error Mask Byte 0	0x549	1353	Bits	1	Diagnostic trouble code mask, byte 0
Error Mask Byte 1	0x54a	1354	Bits	1	Diagnostic trouble code mask, byte 1
Error Mask Byte 2	0x54b	1355	Bits	1	Diagnostic trouble code mask, byte 2
Error Mask Byte 3	0x54c	1356	Bits	1	Diagnostic trouble code mask, byte 3
Error Mask Byte 4	0x54d	1357	Bits	1	Diagnostic trouble code mask, byte 4
Error Mask Byte 5	0x54e	1358	Bits	1	Diagnostic trouble code mask, byte 5
Error Mask Byte 6	0x54f	1359	Bits	1	Diagnostic trouble code mask, byte 6
Error Mask Byte 7	0x550	1360	Bits	1	Diagnostic trouble code mask, byte 7
Error Mask Byte 8	0x551	1361	Bits	1	Diagnostic trouble code mask, byte 8

BUEYD (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Error Mask Byte 9	0x552	1362	Bits	1	Diagnostic trouble code mask, byte 9
Error Mask Byte 10	0x553	1363	Bits	1	Diagnostic trouble code mask, byte 10
Dwell Duration	0x555	1365	Array	17	Dwell duration table
Timing Table Load Axis	0x566	1382	Axis	10	Timing table load axis (y-axis)
Timing Table RPM Axis	0x570	1392	Axis	28	Timing table RPM axis (x-axis)
Fuel Map Load Axis	0x58c	1420	Axis	16	Fuel load axis
Fuel Map RPM Axis	0x59c	1436	Axis	40	Fuel RPM axis
2nd Fuel Map Load Axis	0x5c4	1476	Axis	8	Secondary injector load axis
2nd Fuel Map RPM Axis	0x5cc	1484	Axis	24	Secondary injector RPM axis
Timing Table Front	0x600	1536	Map	140	Timing table front cylinder
Timing Table Rear	0x68c	1676	Map	140	Timing table rear cylinder
Fuel Map Front	0x718	1816	Map	320	Front fuel table
Fuel Map Rear	0x858	2136	Map	320	Fuel map rear cylinder
2nd Fuel Map Front	0x998	2456	Map	96	Front showerhead table
2nd Fuel Map Rear	0x9f8	2552	Map	96	Rear showerhead injectors
Air Temperature Maximum Spark Advance Reduction	0xa58	2648	Map	140	Maximum TA spark retard
TP to Load Table TP Axis	0xae4	2788	Axis	8	Throttle position axis for TP to load conversion map
TP to Load Table RPM Axis	0xaec	2796	Axis	16	RPM axis for TP to load conversion map
TP to Load Table	0xafc	2812	Map	64	Throttle position axis for TP to load conversion map
MAP to Load Table MAP Axis	0xb3c	2876	Axis	8	MAP axis for MAP to load conversion map
MAP to Load Table RPM Axis	0xb44	2884	Axis	16	RPM axis for MAP to load conversion map
MAP to Load Table Front	0xb54	2900	Map	64	Convert front MAP to load
MAP to Load Table Rear	0xb94	2964	Map	64	Convert rear MAP to load
TP to Load Weight Table TP Axis	0xbd4	3028	Axis	8	Throttle position axis for TP to load weight map
TP to Load Weight Table RPM Axis	0xbdc	3036	Axis	16	RPM axis for TP to load weight map
TP to Load Weight Table	0xbec	3052	Map	64	Weight of TPS (vs MAP) in load calculation
Fan Duty Cycle Map Temperature Axis	0xc2c	3116	Axis	4	Engine temperature axis for fan duty cycle map
Fan Duty Cycle Map Battery Axis	0xc30	3120	Axis	8	Battery voltage axis for fan duty cycle map
Fan Duty Cycle Map	0xc38	3128	Map	16	Fan duty cycle map for battery and engine temperature
Fan Key-On On Temperature Table	0xc48	3144	Table	8	Key-on fan on temp based on battery voltage
Fan Key-On Off Temperature Table	0xc50	3152	Table	8	Key-on fan off temp based on battery voltage
Fan On Temperature Table with Key-Off	0xc58	3160	Table	8	Key-off fan on temp based on battery voltage
Fan Off Temperature Table with Key-Off	0xc60	3168	Table	8	Key-off fan off temp based on battery voltage
Minimum Battery Voltage with Key-Off	0xc68	3176	Table	8	Min bat for fuel pump and fans after key-off
IAC Setpoint Map Temperature Axis	0xc70	3184	Axis	6	Engine temperature axis for IAC setpoint map
IAC Setpoint Map Battery Axis	0xc76	3190	Axis	8	Battery voltage axis for IAC setpoint map
IAC Setpoint Map	0xc7e	3198	Map	24	IAC RPM setpoint map for battery voltage and engine temperature

20.6 BUEZD (DDFI-3)

BUEZD (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
IAC Average Position	0xfffffffed	-19	Value	1	Average IAC position when PID control is active
Active Intake Actuations	0xfffffffee	-18	Value	2	Count of Active Intake actuations since cleared
AMC Key-On Status	0xfffffff6	-10	Bits	1	AMC status when ignition is switched on
Baro Pressure Sensor Stored Value	0xfffffff8	-8	Value	1	Stored barometric sensor reading
Stored Error Byte 0	0xfffffff9	-7	Bits	1	Stored (historic) trouble codes, byte 0
Stored Error Byte 1	0xfffffffa	-6	Bits	1	Stored (historic) trouble codes, byte 1
Stored Error Byte 2	0xfffffffb	-5	Bits	1	Stored (historic) trouble codes, byte 2
Stored Error Byte 3	0xfffffffc	-4	Bits	1	Stored (historic) trouble codes, byte 3
Stored Error Byte 4	0xfffffffd	-3	Bits	1	Stored (historic) trouble codes, byte 4
Stored Error Byte 5	0xfffffffe	-2	Bits	1	Stored (historic) trouble codes, byte 5
Stored Error Byte 6	0xffffffff	-1	Bits	1	Stored (historic) trouble codes, byte 6
Stored Error Byte 7	0x0	0	Bits	1	Stored (historic) trouble codes, byte 7
Stored Error Byte 8	0x1	1	Bits	1	Stored (historic) trouble codes, byte 8
Stored Error Byte 9	0x2	2	Bits	1	Stored (historic) trouble codes, byte 9
Stored Error Byte 10	0x3	3	Bits	1	Stored (historic) trouble codes, byte 10
Number of Rides since Error Set	0x4	4	Value	1	Number of rides since a trouble code was set
Calibration ID	0x5	5	Value	1	Country specific calibration identifier
AFV Rear	0x6	6	Value	2	Adaptive fuel value rear cylinder
System Configuration	0x8	8	Bits	1	Global ECM setup
Layout Revision	0x9	9	Value	1	Cal Structure Revision (read only)
Engine Running RPM Hysteresis High Value	0xe	14	Value	2	Upper engine running threshold
Engine Running RPM Hysteresis Low Value	0x10	16	Value	2	Lower engine running threshold
Throttle Position Sensor Reset Voltage	0x12	18	Value	2	TPS voltage with a fully closde throttle, written on a TPS reset
Throttle Position Sensor Voltage Range	0x14	20	Value	2	TPS voltage difference from fully closed to WOT
Throttle Position Sensor Degrees Range	0x16	22	Value	2	TPS degrees difference from fully closed to WOT
Throttle Position Sensor Moving Average Fraction	0x18	24	Value	1	TPS fraction used to detect TP changes
Calibration String	0x24	36	String	8	Country version identifier
O2 Sensor Rich Voltage	0x2e	46	Value	1	O2 sensor voltage indicating a rich mixture
O2 Sensor Lean Voltage	0x2f	47	Value	1	O2 sensor voltage indicating a lean mixture
Closed Loop Feature Minimum RPM	0x30	48	Value	1	Minimum RPM to activate O2 sensor
Closed Loop Feature Minimum Throttle	0x31	49	Value	1	Minimum throttle to activate O2 sensor
O2 Sensor Activation Time	0x32	50	Value	1	O2 sensor activation delay
O2 Sensor Deactivation Time	0x33	51	Value	1	O2 sensor deactivation delay
Startup Fuel Pulsewidth	0x34	52	Table	6	Starting fuel pulse length
Pre Sync Fuel Maximum Engine Temperature	0x3a	58	Value	1	Max engine temp for pre-sync fuel pulses
Post Sync Fuel Maximum Engine Temperature	0x3b	59	Value	1	Max engine temp for post-sync fuel pulses
Fuel Pump Duty Cycle Table	0x3c	60	Table	6	Fuel pump duty cycle table
Fuel Pump Frequency	0x42	66	Value	1	Fuel pump PWM frequency
AD-Converter Input Select	0x43	67	Value	1	Analog-digital conversion input
MAP Sensor Front Reading Position	0x44	68	Value	1	Crankshaft position to read front MAP sensor

BUEZD (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
MAP Sensor Rear Reading Position	0x45	69	Value	1	Crankshaft position to read rear MAP sensor
TPS-MAP Load Configuration	0x46	70	Bits	1	Throttle Map Load Configuration
TPS-MAP Load Maximum RPM	0x47	71	Value	1	Maximum RPM for combined TPS/MAP (TPS above)
Live Log Configuration	0x48	72	Bits	1	Live Log Configuration
Global Fuel Correction	0x4a	74	Value	1	Global fuel correction factor, applied to all map regions
Acceleration Enrichment Configuration	0x4b	75	Bits	1	Acceleration Enrichment Configuration
Acceleration Enrichment Front Pulse Start	0x4d	77	Value	1	Camshaft or crankshaft position to start late acceleration pulse for the front cylinder
Acceleration Enrichment Rear Pulse Start	0x4e	78	Value	1	Camshaft or crankshaft position to start late acceleration pulse for the rear cylinder
Light Acceleration Condition	0x4f	79	Value	1	TPS change indicating a light accel. condition
Full Acceleration Condition	0x50	80	Value	1	Change in throttle movement indicationg a full acceleration condition
Acceleration Enrichment Duration	0x51	81	Value	1	Full acceleration enrichment duration in engine revs
Acceleration Enrichment Region	0x52	82	Table	4	Acceleration enrichment region
Acceleration Enrichment Temperature Adjustment	0x56	86	Table	8	Acceleration enrichment adjustment on engine temperature
Acceleration Enrichment	0x5e	94	Table	8	Acceleration enrichment
Deceleration Correction Region	0x66	102	Table	8	Deceleration correction region
Deceleration Correction	0x6e	110	Value	1	Deceleration correction
Deceleration Condition Hysteresis	0x6f	111	Value	1	Deceleration condition throttle hysteresis
Throttle Roll-Off Condition	0x70	112	Value	1	Throttle roll-off condition
Throttle Roll-Off Correction	0x71	113	Value	1	Throttle roll-off fuel correction
Fuel Cut Region	0x72	114	Table	4	Fuel cut region
Deceleration Learn Maximum RPM	0x76	118	Value	1	Deceleration learn mode maximum RPM
Deceleration Learn Minimum RPM	0x77	119	Value	1	Deceleration learn mode minimum RPM
Deceleration Learn Minimum Duration	0x78	120	Value	1	Engine revs for deceleration learn mode
Deceleration Learn Minimum Readings	0x79	121	Value	1	Number of consecutive rich O2 readings required
WOT Region	0x7a	122	Table	4	Wide-Open Throttle definition
WOT Enrichment	0x7e	126	Value	2	Default fuel correction, applied to WOT regions
Idle Correction	0x80	128	Table	8	Idle correction
Idle Maxiumum Engine Speed	0x88	136	Value	2	Idle region maximum RPM
Idle Maxiumum Load	0x8a	138	Value	1	Idle region maximum throttle
Open Loop Enrichment Delay	0x8b	139	Value	1	Time before increasing AFV
Startup Enrichment Temperature Axis	0x8c	140	Axis	4	Startup condition temperature axis
Startup Enrichment	0x90	144	Table	4	Fuell correction after egine startup
Startup Enrichment Duration	0x94	148	Table	4	Duration of startup fuel enrichment
Open Loop Default Correction	0x98	152	Value	2	Default fuel correction, applied to open loop regions
Front Cylinder Correction	0x9a	154	Table	8	Front cylinder fuel enrichment on engine temperature
Warmup Enrichment	0xa2	162	Table	28	Engine Temp fuel correction
Hot Start Condition	0xbe	190	Value	2	Engine temperature indicating a hot start condition
Engine Temperature Sensor Conversion Data	0xc0	192	Table	28	Engine temperature senor data
Air Temperature Correction	0xdc	220	Table	14	Air Temp correction
Air Temperature Sensor Data	0xea	234	Table	28	Air temperature sensor data
Battery Voltage Correction	0x106	262	Table	12	Battery voltage correction
2nd Battery Voltage Correction	0x112	274	Table	12	Battery correction for showerheads

BUEZD (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Barometric Pressure Sensor Reading Configuration	0x11e	286	Bits	1	Barometric pressure sensor access setup
Baro Pressure Sensor Delay	0x11f	287	Value	1	Delay before reading barometric pressure sensor when switching on ignition
Barometric Feature Region	0x120	288	Table	8	Barometric feature region lower boundary
MAP Barometric Correction	0x128	296	Table	8	Baro adjustment of MAP reads
Baro Pressure Sensor Moving Average Factor	0x130	304	Value	1	Baro Pressure Sensor Moving Average Factor
Airbox Pressure Configuration	0x131	305	Bits	1	Air pressure sensor configuration byte
Barometric Pressure Key-On Minimum Value	0x132	306	Value	1	Minimum valid barometric pressure sensor reading when switching on ignition
Barometric Pressure Key-On Maximum Value	0x133	307	Value	1	Maximum valid barometric pressure sensor reading when switching on ignition
Airbox Pressure Sensor Data	0x134	308	Table	14	Air Box Pressure conversion
Baro Correction	0x142	322	Table	14	Baro pressure correction
Vehicle Speed Correction	0x150	336	Table	16	Airbox pressure correction for speed
Airbox Pressure Correction	0x160	352	Table	16	Airbox pressure correction
Calibration Mode Number of Readings	0x171	369	Value	1	Number of O2 sensor readings required to adjust AFV
Closed Loop Region Upper Boundary	0x172	370	Table	8	Closed loop upper boundary
Closed Loop Region Lower Boundary	0x17a	378	Table	18	Closed loop lower boundary
Closed Loop Upper Boundary Load Hysteresis	0x18c	396	Value	1	Upper closed loop boundary hysteresis, TPP
Closed Loop Lower Boundary Load Hysteresis	0x18d	397	Value	1	Lower closed loop boundary hysteresis, TPP
Closed Loop Upper Boundary RPM Hysteresis	0x18e	398	Value	2	Closed loop upper boundary RPM hysteresis
Closed Loop Lower Boundary RPM Hysteresis	0x190	400	Value	2	Closed loop lower boundary RPM hysteresis
EGO Correction Maximum Value	0x192	402	Value	2	Maximum closed loop EGO correction
EGO Correction Minimum Value	0x194	404	Value	2	Minimum closed loop EGO correction
Closed Loop Maximum Engine Temperature	0x196	406	Value	2	Maximum engine temperature to activate closed loop
Closed Loop Minimum Engine Temperature	0x198	408	Value	2	Minimum engine temperature to activate closed loop
Closed Loop Lower Boundary Adjustment Value	0x19a	410	Value	1	Lower closed loop region boundary adjustment value
Closed Loop Lower Boundary Adjustment Highest Gear	0x19b	411	Value	1	Highest gear where lower closed loop region boundary is adjusted
AFV Maximum Value	0x19c	412	Value	2	Maximum allowed AFV
AFV Minimum Value	0x19e	414	Value	2	Minimum allowed AFV
AFV Increase Factor	0x1a0	416	Value	2	Factor applied to increase AFV
AFV Decrease Factor	0x1a2	418	Value	2	Factor applied to decrease AFV
Calibration Mode Maximum Engine Temperature	0x1a4	420	Value	2	Maximum engine temperature to enable calibration mode
Calibration Mode Minimum Engine Temperature	0x1a6	422	Value	2	Minimum engine temperature to enable calibration mode
Calibration Mode Region Upper Boundary	0x1a8	424	Table	8	Calibration mode region upper boundary
Calibration Mode Region Lower Boundary	0x1b0	432	Table	14	Calibration mode region lower boundary
Altitude Adjustement Lower Boundary	0x1be	446	Table	6	Altitude adjustment lower boundary
Altitude Adjustment Upper Boundary	0x1c4	452	Table	6	Altitude adjustment upper boundary
Fuel PI Controller Low RPM Threshold	0x1ca	458	Value	1	PI controller low value RPM limit

BUEZD (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Fuel PI Controller Low Load Threshold	0x1cb	459	Value	1	PI controller low value load limit
Fuel PI Controller High RPM Threshold	0x1cc	460	Value	1	PI controller high value RPM limit
Fuel PI Controller High Load Threshold	0x1cd	461	Value	1	PI controller high value load limit
O2 Sensor Target Voltage Array	0x1ce	462	Array	4	O2 midpoint for idle, lo, mid and hi
Fuel PI Controller P-Value Table Front when Rich	0x1d2	466	Array	4	Proportional values for the front cylinder and rich transition (idle, low, mid, high)
Fuel PI Controller I-Value Table Front when Rich	0x1d6	470	Array	4	Integral values for the front cylinder and rich mixture (idle, low, mid, high)
Fuel PI Controller P-Value Table Front when Lean	0x1da	474	Array	4	Proportional values for the front cylinder and lean transition (idle, low, mid, high)
Fuel PI Controller I-Value Table Front when Lean	0x1de	478	Array	4	Integral values for the front cylinder and lean mixture (idle, low, mid, high)
Fuel PI Controller P-Value Table Rear when Rich	0x1e2	482	Array	4	Proportional values for the rear cylinder and rich transition (idle, low, mid, high)
Fuel PI Controller I-Value Table Rear when Rich	0x1e6	486	Array	4	Integral values for the rear cylinder and rich mixture (idle, low, mid, high)
Fuel PI Controller P-Value Table Rear when Lean	0x1ea	490	Array	4	Proportional values for the rear cylinder and lean transition (idle, low, mid, high)
Fuel PI Controller I-Value Table Rear when Lean	0x1ee	494	Array	4	Integral values for the rear cylinder and lean mixture (idle, low, mid, high)
Fuel Pulse Endpoint Table for Engine Temperature	0x1f8	504	Table	6	Fuel pulse endpoint temperature correction
Fuel Pulse Endpoint Table for Load	0x1fe	510	Table	6	Fuel pulse endpoint throttle correction
2nd Fuel Puls Endpoint Temperature Correction	0x204	516	Table	6	Showerhead pulse end point, ET based
2nd Fuel Pulse Endpoint Throttle Correction	0x20a	522	Table	6	Showerhead pulse end point, load based
Table Lock Value	0x210	528	Value	2	
AFV Storage Delay	0x212	530	Value	1	Time between AFV writes to EEPROM
Global Spark Advance	0x213	531	Value	1	Global spark advance adjustment
Timed Spark Adjust Minimum RPM	0x214	532	Value	2	Minimum RPM to enable spark advance adjusting
Idle Spark Advance Temperature Adjustment	0x216	534	Table	8	Idle spark advance temperature correction
WOT Spark Advance Reduction	0x21e	542	Table	8	WOT spark advance reduction
Air Temperature Spark Retard Configuration	0x226	550	Bits	1	Air Temp Retard Configuration
Air Temperature Spark Advance Reduction Scaling	0x238	568	Table	14	Air temp spark retard
VSS Input Minimum Frequency	0x247	583	Value	1	Minimum valid VSS input frequency
VSS Input Scaling Factor	0x248	584	Value	2	Scale factor for VSS input
VSS Output Scaling Factor	0x24a	586	Value	2	Scale factor for VSS output
VS-RPM Ratio VS Sampling Time	0x24c	588	Value	1	Time to count speed sensor pulses
Speed-RPM Ratio RPM Sample Duration	0x24d	589	Value	1	Sample period for Speed-RPM ratio
VSS Ratio Gearing Table	0x24e	590	Array	6	Gear selection
Spark Advance Retard Configuration	0x254	596	Bits	1	Spark advance and fuel reduction configuration
Spark Advance Retard Minimum Engine Temperature	0x255	597	Value	1	Minimum engine temperature to enable reduction
Spark Advance Reduction Upper RPM Boundary	0x256	598	Array	7	Maximum RPM to enable reduction
Spark Advance Reduction Lower RPM boundary	0x25d	605	Array	7	Minimum RPM to enable reduction
Spark Advance Reduction Fuel Correction	0x264	612	Array	7	Fuel correction during activation

BUEZD (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Spark Advance Reduction	0x26b	619	Array	7	The spark advance reduction while noise abatement is active
Spark Advance Reduction Ramp-In Duration	0x272	626	Array	7	Spark advance reduction ramp-in duration
Spark Advance Reduction Hold Duration	0x279	633	Array	7	Spark advance reduction hold duration
Spark Advance Reduction Ramp-Out Duration	0x280	640	Array	7	Spark advance reduction ramp-out duration
Active Intake Configuration	0x287	647	Bits	1	Active intake controller setup
Active Intake Gearing	0x288	648	Bits	1	Active intake gearing configuration byte
Active Intake Period	0x289	649	Value	1	Active intake control period
Active Intake Ramp In Duty Cycle	0x28a	650	Value	1	Active intake ramp-in period duty cycle
Active Intake Hold Duty Cycle	0x28b	651	Value	1	Active intake hold period duty cycle
Active Intake Ramp Out Duty Cycle	0x28c	652	Value	1	Active intake ramp-out period duty cycle
Fuel and Spark Skip Configuation	0x28d	653	Bits	1	Fuel and Spark Skip Configuation
RPM Fixed Limit Cold Start Ramp	0x28e	654	Value	1	Temperature delta to ramp from cold RPM limits
Soft Limit Ignition Pattern Front	0x28f	655	Bits	1	Front Soft Limit Fire Pattern
Soft Limit Ignition Pattern Rear	0x290	656	Bits	1	Rear Soft Limit Fire Pattern
Hard Limit Ignition Pattern Front	0x291	657	Bits	1	Front Hard Limit Fire Pattern
Hard Limit Ignition Pattern Rear	0x292	658	Bits	1	Rear Hard Limit Fire Pattern
RPM Fixed Soft Limit Trigger for Cold Engine	0x293	659	Value	1	Cold engine soft RPM limit, high
RPM Fixed Soft Limit Recharge for Cold Engine	0x294	660	Value	1	Cold engine soft RPM limit, low
RPM Fixed Hard Limit Trigger for Cold Engine	0x295	661	Value	1	Cold engine hard RPM limit, high
RPM Fixed Hard Limit Recharge for Cold Engine	0x296	662	Value	1	Cold engine hard RPM limit, low
RPM Fixed Soft Limit Trigger	0x297	663	Value	1	Fixed soft limit trigger RPM
RPM Fixed Soft Limit Recharge	0x298	664	Value	1	Fixed soft limit release RPM
RPM Fixed Hard Limit Trigger	0x299	665	Value	1	Fixed hard limit trigger RPM
RPM Fixed Hard Limit Recharge	0x29a	666	Value	1	Fixed hard limit release RPM
RPM Fixed Kill Limit Trigger	0x29b	667	Value	1	Kill limit trigger RPM
RPM Fixed Kill Limit Recharge	0x29c	668	Value	1	Kill limit release RPM
RPM High Speed Hysteresis High Value	0x29d	669	Value	1	High speed speed-RPM ration hysteresis, upper value
RPM High Speed Hysteresis Low Value	0x29e	670	Value	1	High speed speed-RPM ration hysteresis, lower value
RPM High Speed Timed Limit Timer Start	0x29f	671	Value	1	RPM threshold to start limit timer at high speed
RPM High Speed Timed Limit Timer Reset	0x2a0	672	Value	1	RPM threshold to reset limit timer at high speed
RPM High Speed Timed Hard Limit	0x2a1	673	Value	1	RPM threshold to enable delayed hard limit at high speed
RPM High Speed Timed Soft Limit	0x2a2	674	Value	1	RPM threshold to enable delayed soft limit at high speed
RPM High Speed Timed Soft Limit Delay	0x2a3	675	Value	1	Soft limit delay at high speed
RPM High Speed Timed Hard Limit Delay	0x2a4	676	Value	1	Hard limit delay at high speed
RPM Low Speed Timed Limit Timer Start	0x2a5	677	Value	1	RPM threshold to start limit timer at low speed
RPM Low Speed Timed Limit Timer Reset	0x2a6	678	Value	1	RPM threshold to reset limit timer at low speed
RPM Low Speed Timed Hard Limit	0x2a7	679	Value	1	RPM threshold to enable delayed hard limit at low speed
RPM Low Speed Timed Soft Limit	0x2a8	680	Value	1	RPM threshold to enable delayed soft limit at low speed

BUEZD (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
RPM Low Speed Timed Soft Limit Delay	0x2a9	681	Value	1	Soft limit delay at low speed
RPM Low Speed Timed Hard Limit Delay	0x2aa	682	Value	1	Hard limit delay at low speed
Temperature Soft Limit Minimum Load	0x2ab	683	Value	1	Load above which soft temp limit enabled
Temperature Soft Limit Minimum RPM	0x2ac	684	Value	1	Minimum RPM to enable temperature soft limit
Temperature Hard Limit Minimum Load	0x2ad	685	Value	1	Load above which hard temp limit enabled
Temperature Hard Limit Minimum RPM	0x2ae	686	Value	1	Minimum RPM to enable temperature hard limit
Temperature Soft Limit Trigger	0x2af	687	Value	1	Temperature threshold to trigger soft limit
Temperature Soft Limit Recharge	0x2b0	688	Value	1	Temperature threshold to recharge soft limit
Temperature Hard Limit Trigger	0x2b1	689	Value	1	Temperature trheshold to trigger hard limit
Temperature Hard Limit Recharge	0x2b2	690	Value	1	Temperature threshold to recharge hard limit
Ignore Minimum RPM Trigger	0x2b3	691	Value	1	Temperature threshold indicating to ignore RPM/throttle limits
Ignore Minimum RPM Recharge	0x2b4	692	Value	1	Temperature threshold indicating to obey RPM/throttle limits
Temperature Kill Limit Trigger	0x2b5	693	Value	1	Temperature trheshold to trigger hard limit
Temperature Kill Limit Recharge	0x2b6	694	Value	1	Temperature threshold to recharge kill limit
Temperature Limit Engine Lamp On Value	0x2b7	695	Value	1	Temperature threshold to switch on engine lamp
Temperature Limit Engine Lamp Off Value	0x2b8	696	Value	1	Temperature threshold to switch off engine lamp
Fan Configuration	0x2b9	697	Bits	1	Fan Configuration
Fan Key-On Off Temperature	0x2ba	698	Value	1	Temperature threshold to switch off fan
Fan Key-On On Temperature	0x2bb	699	Value	1	Temperature threshold to switch on fan
Fan Key-On Duty Cycle	0x2bc	700	Table	8	Fan key-on duty cycle
Fan Duty Cycle Period	0x2c4	708	Value	1	Cooling Fan Control Period
Fan Key-Off Run Delay	0x2c5	709	Value	1	Key-off delay before starting fan
Fan Key-Off Run Duty Cycle	0x2c6	710	Value	1	Fan duty cycle after key-off
Fan Key-Off On Temperature	0x2c7	711	Value	1	Key-off temperature threshold to switch off fan
Fan Key-Off Off Temperature	0x2c8	712	Value	1	Key-off temperature threshold to switch on fan
Fan Key-Off Maximum Duration	0x2c9	713	Value	1	Maximum time running fan after key-off
Fan Key-Off Minimum Battery Voltage	0x2ca	714	Value	1	Minimum battery voltage to run fan after key-off
Fan 2 Delay	0x2cb	715	Value	1	Delay before switching on fan 2 after turning on fan 1
Fan Duty Cycle Map Temperature Axis	0x2d0	720	Axis	4	Engine temperature axis for fan duty cycle map
Fan Duty Cycle Map Battery Axis	0x2d4	724	Axis	8	Battery voltage axis for fan duty cycle map
Fan Duty Cycle Map	0x2dc	732	Map	16	Fan duty cycle map for battery and engine temperature
Fan Key-On On Temperature Table	0x2ec	748	Table	8	Key-on fan on temp based on battery voltage
Fan Key-On Off Temperature Table	0x2f4	756	Table	8	Key-on fan off temp based on battery voltage
Fan On Temperature Table with Key-Off	0x2fc	764	Table	8	Key-off fan on temp based on battery voltage
Fan Off Temperature Table with Key-Off	0x304	772	Table	8	Key-off fan off temp based on battery voltage
Minimum Battery Voltage with Key-Off	0x30c	780	Table	8	Min bat for fuel pump and fans after key-off
Active Muffler Configuration	0x31c	796	Bits	1	Active Muffler Valve Configuration
Active Muffler WOT Condition Hysteresis	0x31d	797	Value	1	Active exhaust valve WOT condition hysteresis
Active Muffler Motor Minimum On Time	0x31e	798	Value	1	Active exhaust valve controller minimum on-time

BUEZD (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Active Muffler Motor Minimum Off Time	0x31f	799	Value	1	Active exhaust valve controller minimum off-time
Active Muffler Valve Switching Points	0x320	800	Array	6	Active exhaust valve switching RPMs
Shifter Configuration	0x360	864	Bits	1	Shifter Configuration
Shifter Input	0x361	865	Value	1	Input pin to activate shifter feature
Shifter Input Activation Level	0x362	866	Value	1	Shifter feature activation level
Shifter Input Debounce Time	0x363	867	Value	1	Shifter feature debounce time
Shifter Input Minimum Delay	0x364	868	Value	1	Min time between shifts
Shifter Interrupt Duration	0x365	869	Array	7	Length of shift interrupt
Shift Light Configuration	0x36c	876	Bits	1	Shift Light Configuration
Shift Light Flashing Period	0x36d	877	Value	1	Shift light on time while flashing
Shift Light Flashing RPM Hysteresis High	0x36e	878	Array	7	Shift Light flashing above this speed
Shift Light Flashing RPM Hysteresis Low	0x375	885	Array	7	Shift Light stops flashing below this speed
Shift Light On RPM Hysteresis High	0x37c	892	Array	7	Shift Light on above this speed
Shift Light Off RPM Hysteresis Low	0x383	899	Array	7	Shift Light off below this speed
Starter Interlock Configuration	0x38a	906	Bits	1	Starter Interlock Configuration
Sidestand Interlock Signal Threshold	0x38b	907	Value	1	Threshold for sidestand input
Starter Relay Maximum RPM Hysteresis High	0x38c	908	Value	1	Max RPM for starter relay (upper hysteresis)
Starter Relay Maximum RPM Hysteresis Low	0x38d	909	Value	1	Max RPM for starter relay (lower hysteresis)
Sidestand Interlock Maximum Speed	0x38e	910	Value	1	Sidestand interlock disabled after reaching speed
Sidestand Input Number of Errors	0x38f	911	Value	1	Sidestand extended at high speed before failure
Sidestand Input Maximum Reading Allowed	0x390	912	Value	1	Upper limit of sidestand input
Sidestand Input Minimum Reading Allowed	0x391	913	Value	1	Lower limit of sidestand input
Idle Air Control Configuration	0x392	914	Bits	1	Idle air control setup
Idle Air Control Average Maximum Value	0x3a2	930	Value	1	Maximum value for idle air control moving average
Idle Air Control Average Minimum Value	0x3a3	931	Value	1	Minimum value for idle air control moving average
Idle Air Control Moving Average Factor	0x3a6	934	Value	1	Idle air control factor to set up moving average
Idle Air Control Average Maxiumum Engine Temperature	0x3a7	935	Value	1	Maximum engine temperature for idle air control moving average
Idle Air Control Average Minimum Engine Temperature	0x3a8	936	Value	1	Minimum engine temperature for idle air control moving average
Idle Air Control Key-On Position	0x3da	986	Table	8	IAC position for startup
IAC Setpoint Map Temperature Axis	0x3ee	1006	Axis	6	Engine temperature axis for IAC setpoint map
IAC Setpoint Map Battery Axis	0x3f4	1012	Axis	8	Battery voltage axis for IAC setpoint map
IAC Setpoint Map	0x3fc	1020	Map	24	IAC RPM setpoint map for battery voltage and engine temperature
Idle Air Control Startup Correction	0x414	1044	Table	4	IAC RPM setpoint correction for startup
Idle Air Control Throttle Position Adjustment	0x418	1048	Table	16	Throttle position adjustment table for IAC position
Idle Air Control TP Adjustment Scaling	0x428	1064	Table	16	Scaling of IAC throttle position adjustment for throttle position load
CAN Bus Configuration	0x442	1090	Bits	1	CAN bus setup
Global Fuel Scale Increment	0x444	1092	Value	1	Incremental Fuel scale, time per unit of fuel

BUEZD (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Cold Start Condition	0x449	1097	Value	1	Engine temperature indicates a cold engine condition. The CAN cold flag is set and cold engine RPM limit apply.
Aux Power Relay Configuration	0x462	1122	Bits	1	Aux Power Relay Configuration
Aux Power Relay On Battery Voltage	0x463	1123	Value	1	Battery voltage above which aux relay turned on
Aux Power Relay Off Battery Voltage	0x464	1124	Value	1	Battery voltage below which aux relay turned off
Aux Power Relay Switching Delay	0x465	1125	Value	1	Delay before switching aux relay
Spark Plug Cleaning Configuration	0x466	1126	Bits	1	Spark Plug Cleaning Configuration
Spark Plug Cleaning Maximum Engine Temperature	0x468	1128	Value	1	No plug cleaning needed if TE exceeds this
Spark Plug Cleaning Waste Fire Maximum Engine Temperature	0x469	1129	Value	1	Terminate plug cleaning waste fires above this TE
Spark Plug Cleaning Engine Minimum Run Time	0x46a	1130	Value	1	Min time for engine run event for plug cleaning
Spark Plug Cleaning Number of Cold Runs	0x46b	1131	Value	1	Cold run events before plug cleaning needed
Spark Plug Key-On Cleaning Time	0x46d	1133	Value	1	Duration of key-on plug cleaning
Spark Plug Cleaning Number of Waste Fires	0x46e	1134	Value	1	Plug cleaning waste fires per rev
Fuel Pressure Control Configuration	0x472	1138	Bits	1	Fuel Pressure Control Configuration
Fuel Pressure Key-Off Minimum Pressure	0x488	1160	Table	6	Minimum fuel pressure when engine off
Fuel Pressure Setpoint for Startup	0x496	1174	Table	4	Fuel Pressure setpoint at startup
Fuel Pressure Setpoint for Engine Temperature	0x49a	1178	Table	28	Fuel pressure setpoint table for engine temperature
Fuel Pressure Sensor Conversion Table	0x4b6	1206	Table	28	Fuel pressure sensor data
Fuel Pressure Setpoint Load Axis	0x4d2	1234	Axis	6	Load axis for fuel pressure setpoint map
Fuel Pressure Setpoint RPM Axis	0x4d8	1240	Axis	12	RPM axis for fuel pressure setpoint map
Fuel Pressure Setpoint	0x4e4	1252	Map	36	Fuel pressure setpoint map for RPM and load
Voltage and Fuel Pressure Correction Temperature Axis	0x508	1288	Axis	6	Fuel pressure axis for voltage and fuel pressure correction map
Voltage and Fuel Pressure Correction Battery Axis	0x50e	1294	Axis	12	Battery axis for voltage and fuel pressure correction map
Voltage and Fuel Pressure Correction	0x51a	1306	Map	36	Injector adder based on fuel pressure and battery
Fuel Pressure Correction	0x53e	1342	Table	8	Fuel Pressure correction
Fuel Pulse Endpoint Load Axis	0x546	1350	Axis	6	Fuel endpoint load axis
Fuel Pulse Endpoint RPM Axis	0x54c	1356	Axis	12	Fuel endpoint RPM axis
Fuel Pulse Endpoint Table	0x558	1368	Map	36	Fuel endpoint speed/load table
Rides Required to Clear DTC	0x57c	1404	Value	1	Number of rides without error codes set to clear store errors
Throttle Position Sensor Number of Errors	0x57d	1405	Value	1	Number of TPS read failures before error code is set
Throttle Position Sensor Highest Reading Allowed	0x57e	1406	Value	2	Maximum TPS reading
Throttle Position Sensor Lowest Reading Allowed	0x580	1408	Value	2	Minimum TPS reading
Throttle Position Sensor Default Value	0x582	1410	Value	2	TPS default value set on failure
O2 Sensor Test Minimum RPM	0x584	1412	Value	2	Minimum RPM to check for O2 activity
O2 Sensor Test Minimum Throttle	0x586	1414	Value	1	Minimum throttle to check for O2 activity
O2 Sensor Number of Errors	0x587	1415	Value	1	Number of O2 sensor read failures before error code is set

BUEZD (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
O2 Sensor Number of Inactive Reads	0x588	1416	Value	1	Number of inactive results before error code is set
Engine Temperature Sensor Number of Errors	0x589	1417	Value	1	Number of ET sensor read failures before error code is set
Engine Temperature Sensor Highest Reading Allowed	0x58a	1418	Value	1	Maximum ET sensor reading
Engine Temperature Sensor Lowest Reading Allowed	0x58b	1419	Value	1	Minimum ET sensor reading
Engine Temperature Sensor Default Value	0x58c	1420	Value	1	ET sensor default value set on failure
Air Temperature Sensor Highest Reading Allowed	0x58d	1421	Value	1	Maximum allowed air temperature sensor reading
Air Temperature Sensor Lowest Reading Allowed	0x58e	1422	Value	1	Minimum allowed air temperature sensor reading
Air Temperature Sensor Default Value	0x58f	1423	Value	1	Air temperature sensor default value, set on failure
Air Temperature Sensor Number of Errors	0x590	1424	Value	1	Number of air temperature sensor test failures before error code is set
Battery Average Voltage Difference Limit	0x595	1429	Value	1	Maximum difference allowed between average high and low battery voltage
Battery Voltage Test Minimum RPM	0x596	1430	Value	1	Minimum engine speed to perform battery voltage tests
Battery Voltage Number of Errors	0x597	1431	Value	1	Number of battery voltage test failures before error code is set
Battery Voltage Highest Reading Allowed	0x598	1432	Value	2	Battery voltage maximum reading allowed
Battery Voltage Lowest Reading Allowed	0x59a	1434	Value	2	Battery voltage minimum reading allowed
Battery Voltage Default Value	0x59c	1436	Value	2	Battery voltage default value, set on failure
Active Muffler Controller Number of Tests Failed	0x59e	1438	Value	1	Number of AMC test failures before error code is set
Active Muffler Controller Max Feedback Time	0x59f	1439	Value	1	Maximum time allowed for AMC feedback
Active Intake Maximum TPS Reading Allowed	0x5a0	1440	Value	1	Maximum TPS reading while AIC is active
Active Intake Error Counts	0x5a1	1441	Value	1	Number of failed active intake tests before setting an error code
Active Intake Feedback Timeout	0x5a2	1442	Value	1	Active Intake Control feedback timeout
Injector Feedback Highest Reading Allowed	0x5a3	1443	Value	1	Maximum injector feedback reading
Injector Feedback Lowest Reading Allowed	0x5a4	1444	Value	1	Minimum injector feedback reading
Injector Feedback Number of Errors	0x5a5	1445	Value	1	Number of injector feedback test failures before error code is set
Coil Feedback Highest Reading Allowed	0x5a6	1446	Value	1	Maximum allowed coil feedback reading
Coil Feedback Lowest Reading Allowed	0x5a7	1447	Value	1	Minimum allowed coil feedback reading
Coil Feedback Number of Errors	0x5a8	1448	Value	1	Number of failed coil feedback tests before error code is set
Clutch Test Number of VSS Samples	0x5a9	1449	Value	1	Number of vehicle speed samples for clutch diagnostic tests
Clutch Test Minimum Load	0x5aa	1450	Value	1	Minimum load to run clutch diagnostic tests
Clutch Test Timeout	0x5ab	1451	Value	1	Number of failed clutch diagnostic tests before error code is set
Neutral Test Number of VSS Samples	0x5ac	1452	Value	1	Number of vehicle speed samples for neutral diagnostic tests
Neutral Test Minimum Load	0x5ad	1453	Value	1	Minimum load for neutral diagnostic
Neutral Test Timeout	0x5ae	1454	Value	1	Neutral diagnostic timeout
Fuel Pump Feedback Upper Limit	0x5af	1455	Value	1	Maximum fuelpump feedback reading

BUEZD (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Fuel Pump Feedback Off Time before Test	0x5b0	1456	Value	1	Off time before fuel pump feedback checked
Fuel Pump Feedback Number of Errors	0x5b1	1457	Value	1	Number of fuelpump feedback test failures before error code is set
Idle Air Control Position Test Maximum Engine Temperature	0x5b5	1461	Value	1	Maximum engine temperature to test idle air control position
Idle Air Control Position Test Limit High	0x5b6	1462	Value	1	IAC position high diagnostic limit (255 disables)
Idle Air Control Position Test Limit Low	0x5b7	1463	Value	1	IAC position low diagnostic limit
Idle Air Control Highest Reading Allowed	0x5b8	1464	Value	1	IAC high position limit
Idle Air Control Lowest Reading Allowed	0x5b9	1465	Value	1	IAC low position limit
Idle Air Control Position Test Timeout	0x5ba	1466	Value	1	Idle air control position diagnostic timeout
Idle Air Control Test Timeout	0x5bb	1467	Value	1	IAC diagnostic timeout
Tacho Feedback Number of Errors	0x5bc	1468	Value	1	Number of tacho feedback test failures before error code is set
Fan Feedback Off Time before Test	0x5bd	1469	Value	1	Fan off-time before running feedback test
Fan Feedback Number of Errors	0x5be	1470	Value	1	Number of failed fan tests before error code is set
VSS Output Test Timeout	0x5bf	1471	Value	1	Vehicle Speed Ouptut diagnostic timeout
VSS Input Test Minimum RPM	0x5c0	1472	Value	1	Minimum engine speed for VS input diagnostic
VSS Input Test Minimum Load	0x5c1	1473	Value	1	Minimum load for VS input diagnostic
VSS Input Test Timeout	0x5c2	1474	Value	1	Vehicle Speed Input diagnostic timeout
Bank Angle Sensor Highest Reading Allowed	0x5c5	1477	Value	1	Maximum bank angle sensor reading allowed (also: shifter configuration)
Bank Angle Sensor Tip-Over Value	0x5c6	1478	Value	1	Bank angle sensor tip-over value (also: shifter minimum delay between activations)
Bank Angle Sensor Lowest Reading Allowed	0x5c7	1479	Value	1	Minimum bank angles sensor reading allowed (also: shifter debounce period)
Bank Angle Sensor Number of Errors	0x5c8	1480	Value	1	Number of bank angle sensor test failures before error code is set (also: shifter fuel cut duration)
Bank Angle Sensor Tipover Delay	0x5c9	1481	Value	1	Bank angle sensor tip-over detection delay (also: shifter maximum input activation value)
Starter Relay Test Timeout	0x5ca	1482	Value	1	Starter Relay diagnostic timeout
Aux Power Relay Test Feedback Timeout	0x5cb	1483	Value	1	Auxiliary Power Relay diagnostic timeout
EEPROM Test Number of Errors	0x5cc	1484	Value	1	Number of failed EEPROM checksum tests before error code set
AD-Converter Number of Errors	0x5cd	1485	Value	1	Number of failed A/D conversion tests before error code set
Camshaft Sensor Test Minimum RPM	0x5ce	1486	Value	2	Minimum RPM to set lost sync error
Camshaft Sensor Number of Sync Errors	0x5d0	1488	Value	1	Number of revs without sync detected before error code set
Camshaft Sensor Test Number of Consecutive Sync Errors	0x5d1	1489	Value	1	Number of consecutive out-of-sync revs before error code set
AFV Cylinder Difference Limit	0x5d5	1493	Value	1	Learned Fuel Cylinder Difference limit
AFV Cylinder Difference Number of Errors	0x5d6	1494	Value	1	Learned Fuel Cylinder Difference timeout
MAP Sensor Highest Reading Allowed	0x5d7	1495	Value	1	Highest MAP sensor reading allowed
MAP Sensor Lowest Reading Allowed	0x5d8	1496	Value	1	Lowest MAP sensor reading allowed
MAP Sensor Default Value	0x5d9	1497	Value	1	Default MAP value set on failure
Map Sensor Number of Errors	0x5da	1498	Value	1	Number of MAP sensor read failures before error code is set
Barometric Pressure Sensor Highest Reading Allowed	0x5db	1499	Value	1	Barometric pressure sensor maximum reading allowed

BUEZD (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Barometric Pressure Sensor Lowest Reading Allowed	0x5dc	1500	Value	1	Barometric pressure sensor mininmum reading allowed
Barometric Pressure Sensor Configuration	0x5dd	1501	Value	1	Barometric pressure sensor default value, set on failure
Barometric Pressure Sensor Number of Errors	0x5de	1502	Value	1	Number of barometric pressure sensor test failures before error code is set
Error Mask Byte 0	0x5e9	1513	Bits	1	Diagnostic trouble code mask, byte 0
Error Mask Byte 1	0x5ea	1514	Bits	1	Diagnostic trouble code mask, byte 1
Error Mask Byte 2	0x5eb	1515	Bits	1	Diagnostic trouble code mask, byte 2
Error Mask Byte 3	0x5ec	1516	Bits	1	Diagnostic trouble code mask, byte 3
Error Mask Byte 4	0x5ed	1517	Bits	1	Diagnostic trouble code mask, byte 4
Error Mask Byte 5	0x5ee	1518	Bits	1	Diagnostic trouble code mask, byte 5
Error Mask Byte 6	0x5ef	1519	Bits	1	Diagnostic trouble code mask, byte 6
Error Mask Byte 7	0x5f0	1520	Bits	1	Diagnostic trouble code mask, byte 7
Error Mask Byte 8	0x5f1	1521	Bits	1	Diagnostic trouble code mask, byte 8
Error Mask Byte 9	0x5f2	1522	Bits	1	Diagnostic trouble code mask, byte 9
Error Mask Byte 10	0x5f3	1523	Bits	1	Diagnostic trouble code mask, byte 10
Dwell Duration	0x5f5	1525	Array	17	Dwell duration table
Timing Table Load Axis	0x606	1542	Axis	10	Timing table load axis (y-axis)
Timing Table RPM Axis	0x610	1552	Axis	28	Timing table RPM axis (x-axis)
Fuel Map Load Axis	0x62c	1580	Axis	16	Fuel load axis
Fuel Map RPM Axis	0x63c	1596	Axis	40	Fuel RPM axis
2nd Fuel Map Load Axis	0x664	1636	Axis	8	Secondary injector load axis
2nd Fuel Map RPM Axis	0x66c	1644	Axis	24	Secondary injector RPM axis
Timing Table Front	0x700	1792	Map	140	Timing table front cylinder
Timing Table Rear	0x78c	1932	Map	140	Timing table rear cylinder
Fuel Map Front	0x818	2072	Map	320	Front fuel table
Fuel Map Rear	0x958	2392	Map	320	Fuel map rear cylinder
2nd Fuel Map Front	0xa98	2712	Map	96	Front showerhead table
2nd Fuel Map Rear	0xaf8	2808	Map	96	Rear showerhead injectors
Air Temperature Maximum Spark Advance Reduction	0xb58	2904	Map	140	Maximum TA spark retard
TP to Load Table TP Axis	0xbe4	3044	Axis	8	Throttle position axis for TP to load conversion map
TP to Load Table RPM Axis	0xbec	3052	Axis	16	RPM axis for TP to load conversion map
TP to Load Table	0xbfc	3068	Map	64	Throttle position axis for TP to load conversion map
MAP to Load Table MAP Axis	0xc3c	3132	Axis	8	MAP axis for MAP to load conversion map
MAP to Load Table RPM Axis	0xc44	3140	Axis	16	RPM axis for MAP to load conversion map
MAP to Load Table Front	0xc54	3156	Map	64	Convert front MAP to load
MAP to Load Table Rear	0xc94	3220	Map	64	Convert rear MAP to load
TP to Load Weight Table TP Axis	0xcd4	3284	Axis	8	Throttle position axis for TP to load weight map
TP to Load Weight Table RPM Axis	0xcdc	3292	Axis	16	RPM axis for TP to load weight map
TP to Load Weight Table	0xcec	3308	Map	64	Weight of TPS (vs MAP) in load calculation

20.7 BUE1D (DDFI-3)

BUE1D (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
AFV Front	0xffffffea	-22	Value	2	Adaptive fuel value front cylinder
IAC Average Position	0xffffffed	-19	Value	1	Average IAC position when PID control is active
Active Intake Actuations	0xffffffee	-18	Value	2	Count of Active Intake actuations since cleared
Baro Pressure Sensor Stored Value	0xfffffff8	-8	Value	1	Stored barometric sensor reading
Stored Error Byte 0	0xfffffff9	-7	Bits	1	Stored (historic) trouble codes, byte 0
Stored Error Byte 1	0xfffffffa	-6	Bits	1	Stored (historic) trouble codes, byte 1
Stored Error Byte 2	0xfffffffb	-5	Bits	1	Stored (historic) trouble codes, byte 2
Stored Error Byte 3	0xfffffffc	-4	Bits	1	Stored (historic) trouble codes, byte 3
Stored Error Byte 4	0xfffffffd	-3	Bits	1	Stored (historic) trouble codes, byte 4
Stored Error Byte 5	0xfffffffe	-2	Bits	1	Stored (historic) trouble codes, byte 5
Stored Error Byte 6	0xffffffff	-1	Bits	1	Stored (historic) trouble codes, byte 6
Stored Error Byte 7	0x0	0	Bits	1	Stored (historic) trouble codes, byte 7
Stored Error Byte 8	0x1	1	Bits	1	Stored (historic) trouble codes, byte 8
Stored Error Byte 9	0x2	2	Bits	1	Stored (historic) trouble codes, byte 9
Stored Error Byte 10	0x3	3	Bits	1	Stored (historic) trouble codes, byte 10
Number of Rides since Error Set	0x4	4	Value	1	Number of rides since a trouble code was set
Calibration ID	0x5	5	Value	1	Country specific calibration identifier
AFV Rear	0x6	6	Value	2	Adaptive fuel value rear cylinder
System Configuration	0x8	8	Bits	1	Global ECM setup
Layout Revision	0x9	9	Value	1	Cal Structure Revision (read only)
Engine Running RPM Hysteresis High Value	0xe	14	Value	2	Upper engine running threshold
Engine Running RPM Hysteresis Low Value	0x10	16	Value	2	Lower engine running threshold
Throttle Position Sensor Reset Voltage	0x12	18	Value	2	TPS voltage with a fully closde throttle, written on a TPS reset
Throttle Position Sensor Voltage Range	0x14	20	Value	2	TPS voltage difference from fully closed to WOT
Throttle Position Sensor Degrees Range	0x16	22	Value	2	TPS degrees difference from fully closed to WOT
Throttle Position Sensor Moving Average Fraction	0x18	24	Value	1	TPS fraction used to detect TP changes
Calibration String	0x24	36	String	8	Country version identifier
O2 Sensor Rich Voltage	0x2e	46	Value	1	O2 sensor voltage indicating a rich mixture
O2 Sensor Lean Voltage	0x2f	47	Value	1	O2 sensor voltage indicating a lean mixture
Closed Loop Feature Minimum RPM	0x30	48	Value	1	Minimum RPM to activate O2 sensor
Closed Loop Feature Minimum Throttle	0x31	49	Value	1	Minimum throttle to activate O2 sensor
O2 Sensor Activation Time	0x32	50	Value	1	O2 sensor activation delay
O2 Sensor Deactivation Time	0x33	51	Value	1	O2 sensor deactivation delay
Startup Fuel Pulsewidth	0x34	52	Table	6	Starting fuel pulse length
Pre Sync Fuel Maximum Engine Temperature	0x3a	58	Value	1	Max engine temp for pre-sync fuel pulses
Post Sync Fuel Maximum Engine Temperature	0x3b	59	Value	1	Max engine temp for post-sync fuel pulses
Fuel Pump Duty Cycle Table	0x3c	60	Table	6	Fuel pump duty cycle table
Fuel Pump Frequency	0x42	66	Value	1	Fuel pump PWM frequency
AD-Converter Input Select	0x43	67	Value	1	Analog-digital conversion input
MAP Sensor Front Reading Position	0x44	68	Value	1	Crankshaft position to read front MAP sensor

BUE1D (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
MAP Sensor Rear Reading Position	0x45	69	Value	1	Crankshaft position to read rear MAP sensor
TPS-MAP Load Configuration	0x46	70	Bits	1	Throttle Map Load Configuration
TPS-MAP Load Maximum RPM	0x47	71	Value	1	Maximum RPM for combined TPS/MAP (TPS above)
Live Log Configuration	0x48	72	Bits	1	Live Log Configuration
Global Fuel Correction	0x4a	74	Value	1	Global fuel correction factor, applied to all map regions
Acceleration Enrichment Configuration	0x4b	75	Bits	1	Acceleration Enrichment Configuration
Acceleration Enrichment Front Pulse Start	0x4d	77	Value	1	Camshaft or crankshaft position to start late acceleration pulse for the front cylinder
Acceleration Enrichment Rear Pulse Start	0x4e	78	Value	1	Camshaft or crankshaft position to start late acceleration pulse for the rear cylinder
Light Acceleration Condition	0x4f	79	Value	1	TPS change indicating a light accel. condition
Full Acceleration Condition	0x50	80	Value	1	Change in throttle movement indicationg a full acceleration condition
Acceleration Enrichment Duration	0x51	81	Value	1	Full acceleration enrichment duration in engine revs
Acceleration Enrichment Region	0x52	82	Table	4	Acceleration enrichment region
Acceleration Enrichment Temperature Adjustment	0x56	86	Table	8	Acceleration enrichment adjustment on engine temperature
Acceleration Enrichment	0x5e	94	Table	8	Acceleration enrichment
Deceleration Correction Region	0x66	102	Table	8	Deceleration correction region
Deceleration Correction	0x6e	110	Value	1	Deceleration correction
Deceleration Condition Hysteresis	0x6f	111	Value	1	Deceleration condition throttle hysteresis
Throttle Roll-Off Condition	0x70	112	Value	1	Throttle roll-off condition
Throttle Roll-Off Correction	0x71	113	Value	1	Throttle roll-off fuel correction
Fuel Cut Region	0x72	114	Table	4	Fuel cut region
Deceleration Learn Maximum RPM	0x76	118	Value	1	Deceleration learn mode maximum RPM
Deceleration Learn Minimum RPM	0x77	119	Value	1	Deceleration learn mode minimum RPM
Deceleration Learn Minimum Duration	0x78	120	Value	1	Engine revs for deceleration learn mode
Deceleration Learn Minimum Readings	0x79	121	Value	1	Number of consecutive rich O2 readings required
WOT Region	0x7a	122	Table	4	Wide-Open Throttle definition
WOT Enrichment	0x7e	126	Value	2	Default fuel correction, applied to WOT regions
Idle Correction	0x80	128	Table	8	Idle correction
Idle Maxiumum Engine Speed	0x88	136	Value	2	Idle region maximum RPM
Idle Maxiumum Load	0x8a	138	Value	1	Idle region maximum throttle
Open Loop Enrichment Delay	0x8b	139	Value	1	Time before increasing AFV
Startup Enrichment Temperature Axis	0x8c	140	Axis	4	Startup condition temperature axis
Startup Enrichment	0x90	144	Table	4	Fuell correction after egine startup
Startup Enrichment Duration	0x94	148	Table	4	Duration of startup fuel enrichment
Open Loop Default Correction	0x98	152	Value	2	Default fuel correction, applied to open loop regions
Front Cylinder Correction	0x9a	154	Table	8	Front cylinder fuel enrichment on engine temperature
Warmup Enrichment	0xa2	162	Table	28	Engine Temp fuel correction
Hot Start Condition	0xbe	190	Value	2	Engine temperature indicating a hot start condition
Engine Temperature Sensor Conversion Data	0xc0	192	Table	28	Engine temperature senor data
Air Temperature Correction	0xdc	220	Table	14	Air Temp correction
Air Temperature Sensor Data	0xea	234	Table	28	Air temperature sensor data
Battery Voltage Correction	0x106	262	Table	12	Battery voltage correction
2nd Battery Voltage Correction	0x112	274	Table	12	Battery correction for showerheads

BUE1D (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Barometric Pressure Sensor Reading Configuration	0x11e	286	Bits	1	Barometric pressure sensor access setup
Barometric Pressure Sensor Reading Configuration	0x11e	286	Bits	1	Barometric pressure sensor access setup
Baro Pressure Sensor Delay	0x11f	287	Value	1	Delay before reading barometric pressure sensor when switching on ignition
Barometric Feature Region	0x120	288	Table	8	Barometric feature region lower boundary
MAP Barometric Correction	0x128	296	Table	8	Baro adjustment of MAP reads
Baro Pressure Sensor Moving Average Factor	0x130	304	Value	1	Baro Pressure Sensor Moving Average Factor
Airbox Pressure Configuration	0x131	305	Bits	1	Air pressure sensor configuration byte
Barometric Pressure Key-On Minimum Value	0x132	306	Value	1	Minimum valid barometric pressure sensor reading when switching on ignition
Barometric Pressure Key-On Maximum Value	0x133	307	Value	1	Maximum valid barometric pressure sensor reading when switching on ignition
Airbox Pressure Sensor Data	0x134	308	Table	14	Air Box Pressure conversion
Baro Correction	0x142	322	Table	14	Baro pressure correction
Vehicle Speed Correction	0x150	336	Table	16	Airbox pressure correction for speed
Airbox Pressure Correction	0x160	352	Table	16	Airbox pressure correction
Calibration Mode Number of Readings	0x171	369	Value	1	Number of O2 sensor readings required to adjust AFV
Closed Loop Region Upper Boundary	0x172	370	Table	8	Closed loop upper boundary
Closed Loop Region Lower Boundary	0x17a	378	Table	18	Closed loop lower boundary
Closed Loop Upper Boundary Load Hysteresis	0x18c	396	Value	1	Upper closed loop boundary hysteresis, TPP
Closed Loop Lower Boundary Load Hysteresis	0x18d	397	Value	1	Lower closed loop boundary hysteresis, TPP
Closed Loop Upper Boundary RPM Hysteresis	0x18e	398	Value	2	Closed loop upper boundary RPM hysteresis
Closed Loop Lower Boundary RPM Hysteresis	0x190	400	Value	2	Closed loop lower boundary RPM hysteresis
EGO Correction Maximum Value	0x192	402	Value	2	Maximum closed loop EGO correction
EGO Correction Minimum Value	0x194	404	Value	2	Minimum closed loop EGO correction
Closed Loop Maximum Engine Temperature	0x196	406	Value	2	Maximum engine temperature to activate closed loop
Closed Loop Minimum Engine Temperature	0x198	408	Value	2	Minimum engine temperature to activate closed loop
Closed Loop Lower Boundary Adjustment Value	0x19a	410	Value	1	Lower closed loop region boundary adjustment value
Closed Loop Lower Boundary Adjustment Highest Gear	0x19b	411	Value	1	Highest gear where lower closed loop region boundary is adjusted
AFV Maximum Value	0x19c	412	Value	2	Maximum allowed AFV
AFV Minimum Value	0x19e	414	Value	2	Minimum allowed AFV
AFV Increase Factor	0x1a0	416	Value	2	Factor applied to increase AFV
AFV Decrease Factor	0x1a2	418	Value	2	Factor applied to decrease AFV
Calibration Mode Maximum Engine Temperature	0x1a4	420	Value	2	Maximum engine temperature to enable calibration mode
Calibration Mode Minimum Engine Temperature	0x1a6	422	Value	2	Minimum engine temperature to enable calibration mode
Calibration Mode Region Upper Boundary	0x1a8	424	Table	8	Calibration mode region upper boundary
Calibration Mode Region Lower Boundary	0x1b0	432	Table	14	Calibration mode region lower boundary
Altitude Adjustement Lower Boundary	0x1be	446	Table	6	Altitude adjustment lower boundary
Altitude Adjustment Upper Boundary	0x1c4	452	Table	6	Altitude adjustment upper boundary

BUE1D (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Fuel PI Controller Low RPM Threshold	0x1ca	458	Value	1	PI controller low value RPM limit
Fuel PI Controller Low Load Threshold	0x1cb	459	Value	1	PI controller low value load limit
Fuel PI Controller High RPM Threshold	0x1cc	460	Value	1	PI controller high value RPM limit
Fuel PI Controller High Load Threshold	0x1cd	461	Value	1	PI controller high value load limit
O2 Sensor Target Voltage Array	0x1ce	462	Array	4	O2 midpoint for idle, lo, mid and hi
Fuel PI Controller P-Value Table Front when Rich	0x1d2	466	Array	4	Proportional values for the front cylinder and rich transition (idle, low, mid, high)
Fuel PI Controller I-Value Table Front when Rich	0x1d6	470	Array	4	Integral values for the front cylinder and rich mixture (idle, low, mid, high)
Fuel PI Controller P-Value Table Front when Lean	0x1da	474	Array	4	Proportional values for the front cylinder and lean transition (idle, low, mid, high)
Fuel PI Controller I-Value Table Front when Lean	0x1de	478	Array	4	Integral values for the front cylinder and lean mixture (idle, low, mid, high)
Fuel PI Controller P-Value Table Rear when Rich	0x1e2	482	Array	4	Proportional values for the rear cylinder and rich transition (idle, low, mid, high)
Fuel PI Controller I-Value Table Rear when Rich	0x1e6	486	Array	4	Integral values for the rear cylinder and rich mixture (idle, low, mid, high)
Fuel PI Controller P-Value Table Rear when Lean	0x1ea	490	Array	4	Proportional values for the rear cylinder and lean transition (idle, low, mid, high)
Fuel PI Controller I-Value Table Rear when Lean	0x1ee	494	Array	4	Integral values for the rear cylinder and lean mixture (idle, low, mid, high)
Fuel Pulse Endpoint Table for Engine Temperature	0x1f8	504	Table	6	Fuel pulse endpoint temperature correction
Fuel Pulse Endpoint Table for Load	0x1fe	510	Table	6	Fuel pulse endpoint throttle correction
2nd Fuel Puls Endpoint Temperature Correction	0x204	516	Table	6	Showerhead pulse end point, ET based
2nd Fuel Pulse Endpoint Throttle Correction	0x20a	522	Table	6	Showerhead pulse end point, load based
Table Lock Value	0x210	528	Value	2	
AFV Storage Delay	0x212	530	Value	1	Time between AFV writes to EEPROM
Global Spark Advance	0x215	533	Value	1	Global spark advance adjustment
Timed Spark Adjust Minimum RPM	0x216	534	Value	2	Minimum RPM to enable spark advance adjusting
Idle Spark Advance Temperature Adjustment	0x218	536	Table	8	Idle spark advance temperature correction
WOT Spark Advance Reduction	0x230	560	Table	8	WOT spark advance reduction
Air Temperature Spark Retard Configuration	0x247	583	Bits	1	Air Temp Retard Configuration
Air Temperature Spark Advance Reduction Scaling	0x248	584	Table	14	Air temp spark retard
VSS Input Minimum Frequency	0x257	599	Value	1	Minimum valid VSS input frequency
VSS Input Scaling Factor	0x258	600	Value	2	Scale factor for VSS input
VSS Output Scaling Factor	0x25a	602	Value	2	Scale factor for VSS output
VS-RPM Ratio VS Sampling Time	0x25c	604	Value	1	Time to count speed sensor pulses
Speed-RPM Ratio RPM Sample Duration	0x25d	605	Value	1	Sample period for Speed-RPM ratio
VSS Ratio Gearing Table	0x25e	606	Array	6	Gear selection
Spark Advance Retard Configuration	0x264	612	Bits	1	Spark advance and fuel reduction configuration
Spark Advance Reduction Upper RPM Boundary	0x26e	622	Array	7	Maximum RPM to enable reduction
Spark Advance Reduction Lower RPM boundary	0x275	629	Array	7	Minimum RPM to enable reduction
Spark Advance Reduction Fuel Correction	0x27c	636	Array	7	Fuel correction during activation

BUE1D (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Spark Advance Reduction	0x283	643	Array	7	The spark advance reduction while noise abatement is active
Spark Advance Reduction Ramp-In Duration	0x28a	650	Array	7	Spark advance reduction ramp-in duration
Spark Advance Reduction Hold Duration	0x291	657	Array	7	Spark advance reduction hold duration
Spark Advance Reduction Ramp-Out Duration	0x298	664	Array	7	Spark advance reduction ramp-out duration
Active Intake Configuration	0x29f	671	Bits	1	Active intake controller setup
Active Intake Gearing	0x2a0	672	Bits	1	Active intake gearing configuration byte
Active Intake Period	0x2a1	673	Value	1	Active intake control period
Active Intake Ramp In Duty Cycle	0x2a2	674	Value	1	Active intake ramp-in period duty cycle
Active Intake Hold Duty Cycle	0x2a3	675	Value	1	Active intake hold period duty cycle
Active Intake Ramp Out Duty Cycle	0x2a4	676	Value	1	Active intake ramp-out period duty cycle
Fuel and Spark Skip Configuation	0x2a5	677	Bits	1	Fuel and Spark Skip Configuation
RPM Fixed Limit Cold Start Ramp	0x2a6	678	Value	1	Temperature delta to ramp from cold RPM limits
Soft Limit Ignition Pattern Front	0x2a7	679	Bits	1	Front Soft Limit Fire Pattern
Soft Limit Ignition Pattern Rear	0x2a8	680	Bits	1	Rear Soft Limit Fire Pattern
Hard Limit Ignition Pattern Front	0x2a9	681	Bits	1	Front Hard Limit Fire Pattern
Hard Limit Ignition Pattern Rear	0x2aa	682	Bits	1	Rear Hard Limit Fire Pattern
RPM Fixed Soft Limit Trigger for Cold Engine	0x2ab	683	Value	1	Cold engine soft RPM limit, high
RPM Fixed Soft Limit Recharge for Cold Engine	0x2ac	684	Value	1	Cold engine soft RPM limit, low
RPM Fixed Hard Limit Trigger for Cold Engine	0x2ad	685	Value	1	Cold engine hard RPM limit, high
RPM Fixed Hard Limit Recharge for Cold Engine	0x2ae	686	Value	1	Cold engine hard RPM limit, low
RPM Fixed Soft Limit Trigger	0x2af	687	Value	1	Fixed soft limit trigger RPM
RPM Fixed Soft Limit Recharge	0x2b0	688	Value	1	Fixed soft limit release RPM
RPM Fixed Hard Limit Trigger	0x2b1	689	Value	1	Fixed hard limit trigger RPM
RPM Fixed Hard Limit Recharge	0x2b2	690	Value	1	Fixed hard limit release RPM
RPM Fixed Kill Limit Trigger	0x2b3	691	Value	1	Kill limit trigger RPM
RPM Fixed Kill Limit Recharge	0x2b4	692	Value	1	Kill limit release RPM
RPM High Speed Hysteresis High Value	0x2b5	693	Value	1	High speed speed-RPM ration hysteresis, upper value
RPM High Speed Hysteresis Low Value	0x2b6	694	Value	1	High speed speed-RPM ration hysteresis, lower value
RPM High Speed Timed Limit Timer Start	0x2b7	695	Value	1	RPM threshold to start limit timer at high speed
RPM High Speed Timed Limit Timer Reset	0x2b8	696	Value	1	RPM threshold to reset limit timer at high speed
RPM High Speed Timed Hard Limit	0x2b9	697	Value	1	RPM threshold to enable delayed hard limit at high speed
RPM High Speed Timed Soft Limit	0x2ba	698	Value	1	RPM threshold to enable delayed soft limit at high speed
RPM High Speed Timed Soft Limit Delay	0x2bb	699	Value	1	Soft limit delay at high speed
RPM High Speed Timed Hard Limit Delay	0x2bc	700	Value	1	Hard limit delay at high speed
RPM Low Speed Timed Limit Timer Start	0x2bd	701	Value	1	RPM threshold to start limit timer at low speed
RPM Low Speed Timed Limit Timer Reset	0x2be	702	Value	1	RPM threshold to reset limit timer at low speed
RPM Low Speed Timed Hard Limit	0x2bf	703	Value	1	RPM threshold to enable delayed hard limit at low speed
RPM Low Speed Timed Soft Limit	0x2c0	704	Value	1	RPM threshold to enable delayed soft limit at low speed

BUE1D (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
RPM Low Speed Timed Soft Limit Delay	0x2c1	705	Value	1	Soft limit delay at low speed
RPM Low Speed Timed Hard Limit Delay	0x2c2	706	Value	1	Hard limit delay at low speed
Temperature Soft Limit Minimum Load	0x2c3	707	Value	1	Load above which soft temp limit enabled
Temperature Soft Limit Minimum RPM	0x2c4	708	Value	1	Minimum RPM to enable temperature soft limit
Temperature Hard Limit Minimum Load	0x2c5	709	Value	1	Load above which hard temp limit enabled
Temperature Hard Limit Minimum RPM	0x2c6	710	Value	1	Minimum RPM to enable temperature hard limit
Temperature Soft Limit Trigger	0x2c7	711	Value	1	Temperature threshold to trigger soft limit
Temperature Soft Limit Recharge	0x2c8	712	Value	1	Temperature threshold to recharge soft limit
Temperature Hard Limit Trigger	0x2c9	713	Value	1	Temperature trheshold to trigger hard limit
Temperature Hard Limit Recharge	0x2ca	714	Value	1	Temperature threshold to recharge hard limit
Ignore Minimum RPM Trigger	0x2cb	715	Value	1	Temperature threshold indicating to ignore RPM/throttle limits
Ignore Minimum RPM Recharge	0x2cc	716	Value	1	Temperature threshold indicating to obey RPM/throttle limits
Temperature Kill Limit Trigger	0x2cd	717	Value	1	Temperature trheshold to trigger hard limit
Temperature Kill Limit Recharge	0x2ce	718	Value	1	Temperature threshold to recharge kill limit
Temperature Limit Engine Lamp On Value	0x2cf	719	Value	1	Temperature threshold to switch on engine lamp
Temperature Limit Engine Lamp Off Value	0x2d0	720	Value	1	Temperature threshold to switch off engine lamp
Fan Configuration	0x2d9	729	Bits	1	Fan Configuration
Fan Key-On Off Temperature	0x2da	730	Value	1	Temperature threshold to switch off fan
Fan Key-On On Temperature	0x2db	731	Value	1	Temperature threshold to switch on fan
Fan Key-On Duty Cycle	0x2dc	732	Table	8	Fan key-on duty cycle
Fan Duty Cycle Period	0x304	772	Value	1	Cooling Fan Control Period
Fan Key-Off Run Delay	0x305	773	Value	1	Key-off delay before starting fan
Fan Key-Off Run Duty Cycle	0x306	774	Value	1	Fan duty cycle after key-off
Fan Key-Off On Temperature	0x307	775	Value	1	Key-off temperature threshold to switch off fan
Fan Key-Off Off Temperature	0x308	776	Value	1	Key-off temperature threshold to switch on fan
Fan Key-Off Maximum Duration	0x309	777	Value	1	Maximum time running fan after key-off
Fan Key-Off Minimum Battery Voltage	0x30a	778	Value	1	Minimum battery voltage to run fan after key-off
Fan 2 Delay	0x30b	779	Value	1	Delay before switching on fan 2 after turning on fan 1
Active Muffler Configuration	0x30c	780	Bits	1	Active Muffler Valve Configuration
Active Muffler WOT Condition Hysteresis	0x30d	781	Value	1	Active exhaust valve WOT condition hysteresis
Active Muffler Motor Minimum On Time	0x30e	782	Value	1	Active exhaust valve controller minimum on-time
Active Muffler Motor Minimum Off Time	0x30f	783	Value	1	Active exhaust valve controller minimum off-time
Fan Duty Cycle Map Temperature Axis	0x310	784	Axis	4	Engine temperature axis for fan duty cycle map
Fan Duty Cycle Map Battery Axis	0x314	788	Axis	8	Battery voltage axis for fan duty cycle map
Fan Duty Cycle Map	0x31c	796	Map	16	Fan duty cycle map for battery and engine temperature
Fan Key-On On Temperature Table	0x32c	812	Table	8	Key-on fan on temp based on battery voltage
Fan Key-On Off Temperature Table	0x334	820	Table	8	Key-on fan off temp based on battery voltage
Fan On Temperature Table with Key-Off	0x33c	828	Table	8	Key-off fan on temp based on battery voltage
Fan Off Temperature Table with Key-Off	0x344	836	Table	8	Key-off fan off temp based on battery voltage

BUE1D (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Minimum Battery Voltage with Key-Off	0x34c	844	Table	8	Min bat for fuel pump and fans after key-off
Active Muffler Valve Switching Points	0x360	864	Array	6	Active exhaust valve switching RPMs
Shifter Configuration	0x3a0	928	Bits	1	Shifter Configuration
Shifter Input	0x3a1	929	Value	1	Input pin to activate shifter feature
Shifter Input Activation Level	0x3a2	930	Value	1	Shifter feature activation level
Shifter Input Debounce Time	0x3a3	931	Value	1	Shifter feature debounce time
Shifter Input Minimum Delay	0x3a4	932	Value	1	Min time between shifts
Shifter Interrupt Duration	0x3a5	933	Array	7	Length of shift interrupt
Shift Light Configuration	0x3ac	940	Bits	1	Shift Light Configuration
Shift Light Flashing Period	0x3ad	941	Value	1	Shift light on time while flashing
Shift Light Flashing RPM Hysteresis High	0x3ae	942	Array	7	Shift Light flashing above this speed
Shift Light Flashing RPM Hysteresis Low	0x3b5	949	Array	7	Shift Light stops flashing below this speed
Shift Light On RPM Hysteresis High	0x3bc	956	Array	7	Shift Light on above this speed
Shift Light Off RPM Hysteresis Low	0x3c3	963	Array	7	Shift Light off below this speed
Starter Interlock Configuration	0x3ca	970	Bits	1	Starter Interlock Configuration
Sidestand Interlock Signal Threshold	0x3cb	971	Value	1	Threshold for sidestand input
Starter Relay Maximum RPM Hysteresis High	0x3cc	972	Value	1	Max RPM for starter relay (upper hysteresis)
Starter Relay Maximum RPM Hysteresis Low	0x3cd	973	Value	1	Max RPM for starter relay (lower hysteresis)
Sidestand Interlock Maximum Speed	0x3ce	974	Value	1	Sidestand interlock disabled after reaching speed
Sidestand Input Number of Errors	0x3cf	975	Value	1	Sidestand extended at high speed before failure
Sidestand Input Maximum Reading Allowed	0x3d0	976	Value	1	Upper limit of sidestand input
Sidestand Input Minimum Reading Allowed	0x3d1	977	Value	1	Lower limit of sidestand input
Idle Air Control Configuration	0x3d2	978	Bits	1	Idle air control setup
Idle Air Control Average Maximum Value	0x3e2	994	Value	1	Maximum value for idle air control moving average
Idle Air Control Average Minimum Value	0x3e3	995	Value	1	Minimum value for idle air control moving average
Idle Air Control Moving Average Factor	0x3e6	998	Value	1	Idle air control factor to set up moving average
Idle Air Control Average Maxiumum Engine Temperature	0x3e7	999	Value	1	Maximum engine temperature for idle air control moving average
Idle Air Control Average Minimum Engine Temperature	0x3e8	1000	Value	1	Minimum engine temperature for idle air control moving average
Idle Air Control Key-On Position	0x41a	1050	Table	8	IAC position for startup
IAC Setpoint Map Temperature Axis	0x42e	1070	Axis	6	Engine temperature axis for IAC setpoint map
IAC Setpoint Map Battery Axis	0x434	1076	Axis	8	Battery voltage axis for IAC setpoint map
IAC Setpoint Map	0x43c	1084	Map	24	IAC RPM setpoint map for battery voltage and engine temperature
Idle Air Control Startup Correction	0x454	1108	Table	4	IAC RPM setpoint correction for startup
Idle Air Control Throttle Position Adjustment	0x458	1112	Table	16	Throttle position adjustment table for IAC position
Idle Air Control TP Adjustment Scaling	0x468	1128	Table	16	Scaling of IAC throttle position adjustment for throttle position load
CAN Bus Configuration	0x483	1155	Bits	1	CAN bus setup
Global Fuel Scale Increment	0x484	1156	Value	1	Incremental Fuel scale, time per unit of fuel

BUE1D (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Cold Start Condition	0x489	1161	Value	1	Engine temperature indicates a cold engine condition. The CAN cold flag is set and cold engine RPM limit apply.
Aux Power Relay Configuration	0x4a2	1186	Bits	1	Aux Power Relay Configuration
Aux Power Relay On Battery Voltage	0x4a3	1187	Value	1	Battery voltage above which aux relay turned on
Aux Power Relay Off Battery Voltage	0x4a4	1188	Value	1	Battery voltage below which aux relay turned off
Aux Power Relay Switching Delay	0x4a5	1189	Value	1	Delay before switching aux relay
Spark Plug Cleaning Configuration	0x4a6	1190	Bits	1	Spark Plug Cleaning Configuration
Spark Plug Cleaning Maximum Engine Temperature	0x4a8	1192	Value	1	No plug cleaning needed if TE exceeds this
Spark Plug Cleaning Waste Fire Maximum Engine Temperature	0x4a9	1193	Value	1	Terminate plug cleaning waste fires above this TE
Spark Plug Cleaning Engine Minimum Run Time	0x4aa	1194	Value	1	Min time for engine run event for plug cleaning
Spark Plug Cleaning Number of Cold Runs	0x4ab	1195	Value	1	Cold run events before plug cleaning needed
Spark Plug Key-On Cleaning Time	0x4ad	1197	Value	1	Duration of key-on plug cleaning
Spark Plug Cleaning Number of Waste Fires	0x4ae	1198	Value	1	Plug cleaning waste fires per rev
Fuel Pressure Control Configuration	0x4b2	1202	Bits	1	Fuel Pressure Control Configuration
Fuel Pressure Key-Off Minimum Pressure	0x4c8	1224	Table	6	Minimum fuel pressure when engine off
Fuel Pressure Setpoint for Startup	0x4d6	1238	Table	4	Fuel Pressure setpoint at startup
Fuel Pressure Setpoint for Engine Temperature	0x4da	1242	Table	28	Fuel pressure setpoint table for engine temperature
Fuel Pressure Sensor Conversion Table	0x4f6	1270	Table	28	Fuel pressure sensor data
Fuel Pressure Setpoint Load Axis	0x512	1298	Axis	6	Load axis for fuel pressure setpoint map
Fuel Pressure Setpoint RPM Axis	0x518	1304	Axis	12	RPM axis for fuel pressure setpoint map
Fuel Pressure Setpoint	0x524	1316	Map	36	Fuel pressure setpoint map for RPM and load
Voltage and Fuel Pressure Correction Temperature Axis	0x548	1352	Axis	6	Fuel pressure axis for voltage and fuel pressure correction map
Voltage and Fuel Pressure Correction Battery Axis	0x54e	1358	Axis	12	Battery axis for voltage and fuel pressure correction map
Voltage and Fuel Pressure Correction	0x55a	1370	Map	36	Injector adder based on fuel pressure and battery
Fuel Pressure Correction	0x57e	1406	Table	8	Fuel Pressure correction
Fuel Pulse Endpoint Load Axis	0x586	1414	Axis	6	Fuel endpoint load axis
Fuel Pulse Endpoint RPM Axis	0x58c	1420	Axis	12	Fuel endpoint RPM axis
Fuel Pulse Endpoint Table	0x598	1432	Map	36	Fuel endpoint speed/load table
Rides Required to Clear DTC	0x5bc	1468	Value	1	Number of rides without error codes set to clear store errors
Throttle Position Sensor Number of Errors	0x5bd	1469	Value	1	Number of TPS read failures before error code is set
Throttle Position Sensor Highest Reading Allowed	0x5be	1470	Value	2	Maximum TPS reading
Throttle Position Sensor Lowest Reading Allowed	0x5c0	1472	Value	2	Minimum TPS reading
Throttle Position Sensor Default Value	0x5c2	1474	Value	2	TPS default value set on failure
O2 Sensor Test Minimum RPM	0x5c4	1476	Value	2	Minimum RPM to check for O2 activity
O2 Sensor Test Minimum Throttle	0x5c6	1478	Value	1	Minimum throttle to check for O2 activity
O2 Sensor Number of Errors	0x5c7	1479	Value	1	Number of O2 sensor read failures before error code is set

BUE1D (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
O2 Sensor Number of Inactive Reads	0x5c8	1480	Value	1	Number of inactive results before error code is set
Engine Temperature Sensor Number of Errors	0x5c9	1481	Value	1	Number of ET sensor read failures before error code is set
Engine Temperature Sensor Highest Reading Allowed	0x5ca	1482	Value	1	Maximum ET sensor reading
Engine Temperature Sensor Lowest Reading Allowed	0x5cb	1483	Value	1	Minimum ET sensor reading
Engine Temperature Sensor Default Value	0x5cc	1484	Value	1	ET sensor default value set on failure
Air Temperature Sensor Highest Reading Allowed	0x5cd	1485	Value	1	Maximum allowed air temperature sensor reading
Air Temperature Sensor Lowest Reading Allowed	0x5ce	1486	Value	1	Minimum allowed air temperature sensor reading
Air Temperature Sensor Default Value	0x5cf	1487	Value	1	Air temperature sensor default value, set on failure
Air Temperature Sensor Number of Errors	0x5d0	1488	Value	1	Number of air temperature sensor test failures before error code is set
Battery Average Voltage Difference Limit	0x5d5	1493	Value	1	Maximum difference allowed between average high and low battery voltage
Battery Voltage Test Minimum RPM	0x5d6	1494	Value	1	Minimum engine speed to perform battery voltage tests
Battery Voltage Number of Errors	0x5d7	1495	Value	1	Number of battery voltage test failures before error code is set
Battery Voltage Highest Reading Allowed	0x5d8	1496	Value	2	Battery voltage maximum reading allowed
Battery Voltage Lowest Reading Allowed	0x5da	1498	Value	2	Battery voltage minimum reading allowed
Battery Voltage Default Value	0x5dc	1500	Value	2	Battery voltage default value, set on failure
Active Muffler Controller Number of Tests Failed	0x5de	1502	Value	1	Number of AMC test failures before error code is set
Active Muffler Controller Max Feedback Time	0x5df	1503	Value	1	Maximum time allowed for AMC feedback
Active Intake Maximum TPS Reading Allowed	0x5e0	1504	Value	1	Maximum TPS reading while AIC is active
Active Intake Error Counts	0x5e1	1505	Value	1	Number of failed active intake tests before setting an error code
Active Intake Feedback Timeout	0x5e2	1506	Value	1	Active Intake Control feedback timeout
Injector Feedback Highest Reading Allowed	0x5e3	1507	Value	1	Maximum injector feedback reading
Injector Feedback Lowest Reading Allowed	0x5e4	1508	Value	1	Minimum injector feedback reading
Injector Feedback Number of Errors	0x5e5	1509	Value	1	Number of injector feedback test failures before error code is set
Coil Feedback Highest Reading Allowed	0x5e6	1510	Value	1	Maximum allowed coil feedback reading
Coil Feedback Lowest Reading Allowed	0x5e7	1511	Value	1	Minimum allowed coil feedback reading
Coil Feedback Number of Errors	0x5e8	1512	Value	1	Number of failed coil feedback tests before error code is set
Clutch Test Number of VSS Samples	0x5e9	1513	Value	1	Number of vehicle speed samples for clutch diagnostic tests
Clutch Test Minimum Load	0x5ea	1514	Value	1	Minimum load to run clutch diagnostic tests
Clutch Test Timeout	0x5eb	1515	Value	1	Number of failed clutch diagnostic tests before error code is set
Neutral Test Number of VSS Samples	0x5ec	1516	Value	1	Number of vehicle speed samples for neutral diagnostic tests
Neutral Test Minimum Load	0x5ed	1517	Value	1	Minimum load for neutral diagnostic
Neutral Test Timeout	0x5ee	1518	Value	1	Neutral diagnostic timeout
Fuel Pump Feedback Upper Limit	0x5ef	1519	Value	1	Maximum fuelpump feedback reading

BUE1D (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Fuel Pump Feedback Off Time before Test	0x5f0	1520	Value	1	Off time before fuel pump feedback checked
Fuel Pump Feedback Number of Errors	0x5f1	1521	Value	1	Number of fuelpump feedback test failures before error code is set
Idle Air Control Position Test Maximum Engine Temperature	0x5f5	1525	Value	1	Maximum engine temperature to test idle air control position
Idle Air Control Position Test Limit High	0x5f6	1526	Value	1	IAC position high diagnostic limit (255 disables)
Idle Air Control Position Test Limit Low	0x5f7	1527	Value	1	IAC position low diagnostic limit
Idle Air Control Highest Reading Allowed	0x5f8	1528	Value	1	IAC high position limit
Idle Air Control Lowest Reading Allowed	0x5f9	1529	Value	1	IAC low position limit
Idle Air Control Position Test Timeout	0x5fa	1530	Value	1	Idle air control position diagnostic timeout
Idle Air Control Test Timeout	0x5fb	1531	Value	1	IAC diagnostic timeout
Tacho Feedback Number of Errors	0x5fc	1532	Value	1	Number of tacho feedback test failures before error code is set
Fan Feedback Off Time before Test	0x5fd	1533	Value	1	Fan off-time before running feedback test
Fan Feedback Number of Errors	0x5fe	1534	Value	1	Number of failed fan tests before error code is set
VSS Output Test Timeout	0x5ff	1535	Value	1	Vehicle Speed Ouptut diagnostic timeout
VSS Input Test Minimum RPM	0x600	1536	Value	1	Minimum engine speed for VS input diagnostic
VSS Input Test Minimum Load	0x601	1537	Value	1	Minimum load for VS input diagnostic
VSS Input Test Timeout	0x602	1538	Value	1	Vehicle Speed Input diagnostic timeout
Bank Angle Sensor Highest Reading Allowed	0x605	1541	Value	1	Maximum bank angle sensor reading allowed (also: shifter configuration)
Bank Angle Sensor Tip-Over Value	0x606	1542	Value	1	Bank angle sensor tip-over value (also: shifter minimum delay between activations)
Bank Angle Sensor Lowest Reading Allowed	0x607	1543	Value	1	Minimum bank angles sensor reading allowed (also: shifter debounce period)
Bank Angle Sensor Number of Errors	0x608	1544	Value	1	Number of bank angle sensor test failures before error code is set (also: shifter fuel cut duration)
Bank Angle Sensor Tipover Delay	0x609	1545	Value	1	Bank angle sensor tip-over detection delay (also: shifter maximum input activation value)
Starter Relay Test Timeout	0x60a	1546	Value	1	Starter Relay diagnostic timeout
Aux Power Relay Test Feedback Timeout	0x60b	1547	Value	1	Auxiliary Power Relay diagnostic timeout
EEPROM Test Number of Errors	0x60c	1548	Value	1	Number of failed EEPROM checksum tests before error code set
AD-Converter Number of Errors	0x60d	1549	Value	1	Number of failed A/D conversion tests before error code set
Camshaft Sensor Test Minimum RPM	0x60e	1550	Value	2	Minimum RPM to set lost sync error
Camshaft Sensor Number of Sync Errors	0x610	1552	Value	1	Number of revs without sync detected before error code set
Camshaft Sensor Test Number of Consecutive Sync Errors	0x611	1553	Value	1	Number of consecutive out-of-sync revs before error code set
AFV Cylinder Difference Limit	0x615	1557	Value	1	Learned Fuel Cylinder Difference limit
AFV Cylinder Difference Number of Errors	0x616	1558	Value	1	Learned Fuel Cylinder Difference timeout
MAP Sensor Highest Reading Allowed	0x617	1559	Value	1	Highest MAP sensor reading allowed
MAP Sensor Lowest Reading Allowed	0x618	1560	Value	1	Lowest MAP sensor reading allowed
MAP Sensor Default Value	0x619	1561	Value	1	Default MAP value set on failure
Map Sensor Number of Errors	0x61a	1562	Value	1	Number of MAP sensor read failures before error code is set
Barometric Pressure Sensor Highest Reading Allowed	0x61b	1563	Value	1	Barometric pressure sensor maximum reading allowed

BUE1D (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Barometric Pressure Sensor Lowest Reading Allowed	0x61c	1564	Value	1	Barometric pressure sensor mininmum reading allowed
Barometric Pressure Sensor Configuration	0x61d	1565	Value	1	Barometric pressure sensor default value, set on failure
Barometric Pressure Sensor Number of Errors	0x61e	1566	Value	1	Number of barometric pressure sensor test failures before error code is set
Error Mask Byte 0	0x629	1577	Bits	1	Diagnostic trouble code mask, byte 0
Error Mask Byte 1	0x62a	1578	Bits	1	Diagnostic trouble code mask, byte 1
Error Mask Byte 2	0x62b	1579	Bits	1	Diagnostic trouble code mask, byte 2
Error Mask Byte 3	0x62c	1580	Bits	1	Diagnostic trouble code mask, byte 3
Error Mask Byte 4	0x62d	1581	Bits	1	Diagnostic trouble code mask, byte 4
Error Mask Byte 5	0x62e	1582	Bits	1	Diagnostic trouble code mask, byte 5
Error Mask Byte 6	0x62f	1583	Bits	1	Diagnostic trouble code mask, byte 6
Error Mask Byte 7	0x630	1584	Bits	1	Diagnostic trouble code mask, byte 7
Error Mask Byte 8	0x631	1585	Bits	1	Diagnostic trouble code mask, byte 8
Error Mask Byte 9	0x632	1586	Bits	1	Diagnostic trouble code mask, byte 9
Error Mask Byte 10	0x633	1587	Bits	1	Diagnostic trouble code mask, byte 10
Dwell Duration	0x635	1589	Array	17	Dwell duration table
Timing Table Load Axis	0x646	1606	Axis	10	Timing table load axis (y-axis)
Timing Table RPM Axis	0x650	1616	Axis	28	Timing table RPM axis (x-axis)
Fuel Map Load Axis	0x66c	1644	Axis	16	Fuel load axis
Fuel Map RPM Axis	0x67c	1660	Axis	40	Fuel RPM axis
2nd Fuel Map Load Axis	0x6a4	1700	Axis	8	Secondary injector load axis
2nd Fuel Map RPM Axis	0x6ac	1708	Axis	24	Secondary injector RPM axis
Timing Table Front	0x700	1792	Map	140	Timing table front cylinder
Timing Table Rear	0x78c	1932	Map	140	Timing table rear cylinder
Fuel Map Front	0x818	2072	Map	320	Front fuel table
Fuel Map Rear	0x958	2392	Map	320	Fuel map rear cylinder
2nd Fuel Map Front	0xa98	2712	Map	96	Front showerhead table
2nd Fuel Map Rear	0xaf8	2808	Map	96	Rear showerhead injectors
Air Temperature Maximum Spark Advance Reduction	0xb58	2904	Map	140	Maximum TA spark retard
TP to Load Table TP Axis	0xc04	3076	Axis	8	Throttle position axis for TP to load conversion map
TP to Load Table RPM Axis	0xc0c	3084	Axis	16	RPM axis for TP to load conversion map
TP to Load Table	0xc1c	3100	Map	64	Throttle position axis for TP to load conversion map
MAP to Load Table MAP Axis	0xc5c	3164	Axis	8	MAP axis for MAP to load conversion map
MAP to Load Table RPM Axis	0xc64	3172	Axis	16	RPM axis for MAP to load conversion map
MAP to Load Table Front	0xc74	3188	Map	64	Convert front MAP to load
MAP to Load Table Rear	0xcb4	3252	Map	64	Convert rear MAP to load
TP to Load Weight Table TP Axis	0xcf4	3316	Axis	8	Throttle position axis for TP to load weight map
TP to Load Weight Table RPM Axis	0xcfc	3324	Axis	16	RPM axis for TP to load weight map
TP to Load Weight Table	0xd0c	3340	Map	64	Weight of TPS (vs MAP) in load calculation

20.8 BUE2D (DDFI-3)

BUE2D (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
AFV Front	0xffffffea	-22	Value	2	Adaptive fuel value front cylinder
IAC Average Position	0xffffffed	-19	Value	1	Average IAC position when PID control is active
Active Intake Actuations	0xffffffee	-18	Value	2	Count of Active Intake actuations since cleared
Baro Pressure Sensor Stored Value	0xfffffff8	-8	Value	1	Stored barometric sensor reading
Stored Error Byte 0	0xfffffff9	-7	Bits	1	Stored (historic) trouble codes, byte 0
Stored Error Byte 1	0xfffffffa	-6	Bits	1	Stored (historic) trouble codes, byte 1
Stored Error Byte 2	0xfffffffb	-5	Bits	1	Stored (historic) trouble codes, byte 2
Stored Error Byte 3	0xfffffffc	-4	Bits	1	Stored (historic) trouble codes, byte 3
Stored Error Byte 4	0xfffffffd	-3	Bits	1	Stored (historic) trouble codes, byte 4
Stored Error Byte 5	0xfffffffe	-2	Bits	1	Stored (historic) trouble codes, byte 5
Stored Error Byte 6	0xffffffff	-1	Bits	1	Stored (historic) trouble codes, byte 6
Stored Error Byte 7	0x0	0	Bits	1	Stored (historic) trouble codes, byte 7
Stored Error Byte 8	0x1	1	Bits	1	Stored (historic) trouble codes, byte 8
Stored Error Byte 9	0x2	2	Bits	1	Stored (historic) trouble codes, byte 9
Stored Error Byte 10	0x3	3	Bits	1	Stored (historic) trouble codes, byte 10
Number of Rides since Error Set	0x4	4	Value	1	Number of rides since a trouble code was set
Calibration ID	0x5	5	Value	1	Country specific calibration identifier
AFV Rear	0x6	6	Value	2	Adaptive fuel value rear cylinder
System Configuration	0x8	8	Bits	1	Global ECM setup
Layout Revision	0x9	9	Value	1	Cal Structure Revision (read only)
Engine Running RPM Hysteresis High Value	0xe	14	Value	2	Upper engine running threshold
Engine Running RPM Hysteresis Low Value	0x10	16	Value	2	Lower engine running threshold
Throttle Position Sensor Reset Voltage	0x12	18	Value	2	TPS voltage with a fully closde throttle, written on a TPS reset
Throttle Position Sensor Voltage Range	0x14	20	Value	2	TPS voltage difference from fully closed to WOT
Throttle Position Sensor Degrees Range	0x16	22	Value	2	TPS degrees difference from fully closed to WOT
Throttle Position Sensor Moving Average Fraction	0x18	24	Value	1	TPS fraction used to detect TP changes
Calibration String	0x24	36	String	8	Country version identifier
O2 Sensor Rich Voltage	0x2e	46	Value	1	O2 sensor voltage indicating a rich mixture
O2 Sensor Lean Voltage	0x2f	47	Value	1	O2 sensor voltage indicating a lean mixture
Closed Loop Feature Minimum RPM	0x30	48	Value	1	Minimum RPM to activate O2 sensor
Closed Loop Feature Minimum Throttle	0x31	49	Value	1	Minimum throttle to activate O2 sensor
O2 Sensor Activation Time	0x32	50	Value	1	O2 sensor activation delay
O2 Sensor Deactivation Time	0x33	51	Value	1	O2 sensor deactivation delay
Startup Fuel Pulsewidth	0x34	52	Table	6	Starting fuel pulse length
Pre Sync Fuel Maximum Engine Temperature	0x3a	58	Value	1	Max engine temp for pre-sync fuel pulses
Post Sync Fuel Maximum Engine Temperature	0x3b	59	Value	1	Max engine temp for post-sync fuel pulses
Fuel Pump Duty Cycle Table	0x3c	60	Table	6	Fuel pump duty cycle table
Fuel Pump Frequency	0x42	66	Value	1	Fuel pump PWM frequency
AD-Converter Input Select	0x43	67	Value	1	Analog-digital conversion input
MAP Sensor Front Reading Position	0x44	68	Value	1	Crankshaft position to read front MAP sensor

BUE2D (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
MAP Sensor Rear Reading Position	0x45	69	Value	1	Crankshaft position to read rear MAP sensor
TPS-MAP Load Configuration	0x46	70	Bits	1	Throttle Map Load Configuration
TPS-MAP Load Maximum RPM	0x47	71	Value	1	Maximum RPM for combined TPS/MAP (TPS above)
Live Log Configuration	0x48	72	Bits	1	Live Log Configuration
Global Fuel Correction	0x4a	74	Value	1	Global fuel correction factor, applied to all map regions
Acceleration Enrichment Configuration	0x4b	75	Bits	1	Acceleration Enrichment Configuration
Acceleration Enrichment Front Pulse Start	0x4d	77	Value	1	Camshaft or crankshaft position to start late acceleration pulse for the front cylinder
Acceleration Enrichment Rear Pulse Start	0x4e	78	Value	1	Camshaft or crankshaft position to start late acceleration pulse for the rear cylinder
Light Acceleration Condition	0x4f	79	Value	1	TPS change indicating a light accel. condition
Full Acceleration Condition	0x50	80	Value	1	Change in throttle movement indicationg a full acceleration condition
Acceleration Enrichment Duration	0x51	81	Value	1	Full acceleration enrichment duration in engine revs
Acceleration Enrichment Region	0x52	82	Table	4	Acceleration enrichment region
Acceleration Enrichment Temperature Adjustment	0x56	86	Table	8	Acceleration enrichment adjustment on engine temperature
Acceleration Enrichment	0x5e	94	Table	8	Acceleration enrichment
Deceleration Correction Region	0x66	102	Table	8	Deceleration correction region
Deceleration Correction	0x8e	142	Value	1	Deceleration correction
Deceleration Condition Hysteresis	0x8f	143	Value	1	Deceleration condition throttle hysteresis
Throttle Roll-Off Condition	0x90	144	Value	1	Throttle roll-off condition
Throttle Roll-Off Correction	0x91	145	Value	1	Throttle roll-off fuel correction
Fuel Cut Region	0x92	146	Table	4	Fuel cut region
Deceleration Learn Maximum RPM	0x96	150	Value	1	Deceleration learn mode maximum RPM
Deceleration Learn Minimum RPM	0x97	151	Value	1	Deceleration learn mode minimum RPM
Deceleration Learn Minimum Duration	0x98	152	Value	1	Engine revs for deceleration learn mode
Deceleration Learn Minimum Readings	0x99	153	Value	1	Number of consecutive rich O2 readings required
WOT Region	0x9a	154	Table	4	Wide-Open Throttle definition
WOT Enrichment	0x9e	158	Value	2	Default fuel correction, applied to WOT regions
Idle Correction	0xa0	160	Table	8	Idle correction
Idle Maxiumum Engine Speed	0xb0	176	Value	2	Idle region maximum RPM
Idle Maxiumum Load	0xb2	178	Value	1	Idle region maximum throttle
Open Loop Enrichment Delay	0xb3	179	Value	1	Time before increasing AFV
Startup Enrichment Temperature Axis	0xb4	180	Axis	4	Startup condition temperature axis
Startup Enrichment	0xb8	184	Table	4	Fuell correction after egine startup
Startup Enrichment Duration	0xbc	188	Table	4	Duration of startup fuel enrichment
Open Loop Default Correction	0xc0	192	Value	2	Default fuel correction, applied to open loop regions
Front Cylinder Correction	0xc2	194	Table	8	Front cylinder fuel enrichment on engine temperature
Warmup Enrichment	0xca	202	Table	28	Engine Temp fuel correction
Hot Start Condition	0xe6	230	Value	2	Engine temperature indicating a hot start condition
Engine Temperature Sensor Conversion Data	0xe8	232	Table	28	Engine temperature senor data
Air Temperature Correction	0x104	260	Table	14	Air Temp correction
Air Temperature Sensor Data	0x112	274	Table	28	Air temperature sensor data
Battery Voltage Correction	0x12e	302	Table	12	Battery voltage correction
2nd Battery Voltage Correction	0x13a	314	Table	12	Battery correction for showerheads

BUE2D (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Barometric Pressure Sensor Reading Configuration	0x146	326	Bits	1	Barometric pressure sensor access setup
Baro Pressure Sensor Delay	0x147	327	Value	1	Delay before reading barometric pressure sensor when switching on ignition
Barometric Feature Region	0x148	328	Table	8	Barometric feature region lower boundary
MAP Barometric Correction	0x150	336	Table	8	Baro adjustment of MAP reads
Baro Pressure Sensor Moving Average Factor	0x158	344	Value	1	Baro Pressure Sensor Moving Average Factor
Airbox Pressure Configuration	0x159	345	Bits	1	Air pressure sensor configuration byte
Barometric Pressure Key-On Minimum Value	0x15a	346	Value	1	Minimum valid barometric pressure sensor reading when switching on ignition
Barometric Pressure Key-On Maximum Value	0x15b	347	Value	1	Maximum valid barometric pressure sensor reading when switching on ignition
Airbox Pressure Sensor Data	0x15c	348	Table	14	Air Box Pressure conversion
Baro Correction	0x16a	362	Table	14	Baro pressure correction
Vehicle Speed Correction	0x178	376	Table	16	Airbox pressure correction for speed
Airbox Pressure Correction	0x188	392	Table	16	Airbox pressure correction
Calibration Mode Number of Readings	0x199	409	Value	1	Number of O2 sensor readings required to adjust AFV
Closed Loop Region Upper Boundary	0x19a	410	Table	8	Closed loop upper boundary
Closed Loop Region Lower Boundary	0x1a2	418	Table	18	Closed loop lower boundary
Closed Loop Upper Boundary Load Hysteresis	0x1b4	436	Value	1	Upper closed loop boundary hysteresis, TPP
Closed Loop Lower Boundary Load Hysteresis	0x1b5	437	Value	1	Lower closed loop boundary hysteresis, TPP
Closed Loop Upper Boundary RPM Hysteresis	0x1b6	438	Value	2	Closed loop upper boundary RPM hysteresis
Closed Loop Lower Boundary RPM Hysteresis	0x1b8	440	Value	2	Closed loop lower boundary RPM hysteresis
EGO Correction Maximum Value	0x1ba	442	Value	2	Maximum closed loop EGO correction
EGO Correction Minimum Value	0x1bc	444	Value	2	Minimum closed loop EGO correction
Closed Loop Maximum Engine Temperature	0x1be	446	Value	2	Maximum engine temperature to activate closed loop
Closed Loop Minimum Engine Temperature	0x1c0	448	Value	2	Minimum engine temperature to activate closed loop
Closed Loop Lower Boundary Adjustment Value	0x1c2	450	Value	1	Lower closed loop region boundary adjustment value
Closed Loop Lower Boundary Adjustment Highest Gear	0x1c3	451	Value	1	Highest gear where lower closed loop region boundary is adjusted
AFV Maximum Value	0x1c4	452	Value	2	Maximum allowed AFV
AFV Minimum Value	0x1c6	454	Value	2	Minimum allowed AFV
AFV Increase Factor	0x1c8	456	Value	2	Factor applied to increase AFV
AFV Decrease Factor	0x1ca	458	Value	2	Factor applied to decrease AFV
Calibration Mode Maximum Engine Temperature	0x1cc	460	Value	2	Maximum engine temperature to enable calibration mode
Calibration Mode Minimum Engine Temperature	0x1ce	462	Value	2	Minimum engine temperature to enable calibration mode
Calibration Mode Region Upper Boundary	0x1d0	464	Table	8	Calibration mode region upper boundary
Calibration Mode Region Lower Boundary	0x1d8	472	Table	14	Calibration mode region lower boundary
Altitude Adjustement Lower Boundary	0x1e6	486	Table	6	Altitude adjustment lower boundary
Altitude Adjustment Upper Boundary	0x1ec	492	Table	6	Altitude adjustment upper boundary
Fuel PI Controller Low RPM Threshold	0x1f2	498	Value	1	PI controller low value RPM limit

BUE2D (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Fuel PI Controller Low Load Threshold	0x1f3	499	Value	1	PI controller low value load limit
Fuel PI Controller High RPM Threshold	0x1f4	500	Value	1	PI controller high value RPM limit
Fuel PI Controller High Load Threshold	0x1f5	501	Value	1	PI controller high value load limit
O2 Sensor Target Voltage Array	0x1fd	509	Array	4	O2 midpoint for idle, lo, mid and hi
Fuel PI Controller P-Value Table Front when Rich	0x201	513	Array	5	Proportional values for the front cylinder and rich transition (idle, low, mid, high)
Fuel PI Controller I-Value Table Front when Rich	0x206	518	Array	5	Integral values for the front cylinder and rich mixture (idle, low, mid, high)
Fuel PI Controller P-Value Table Front when Lean	0x20b	523	Array	5	Proportional values for the front cylinder and lean transition (idle, low, mid, high)
Fuel PI Controller I-Value Table Front when Lean	0x210	528	Array	5	Integral values for the front cylinder and lean mixture (idle, low, mid, high)
Fuel PI Controller P-Value Table Rear when Rich	0x215	533	Array	5	Proportional values for the rear cylinder and rich transition (idle, low, mid, high)
Fuel PI Controller I-Value Table Rear when Rich	0x21a	538	Array	5	Integral values for the rear cylinder and rich mixture (idle, low, mid, high)
Fuel PI Controller P-Value Table Rear when Lean	0x21f	543	Array	5	Proportional values for the rear cylinder and lean transition (idle, low, mid, high)
Fuel PI Controller I-Value Table Rear when Lean	0x224	548	Array	5	Integral values for the rear cylinder and lean mixture (idle, low, mid, high)
Fuel Pulse Endpoint Table for Engine Temperature	0x230	560	Table	6	Fuel pulse endpoint temperature correction
Fuel Pulse Endpoint Table for Load	0x236	566	Table	6	Fuel pulse endpoint throttle correction
2nd Fuel Puls Endpoint Temperature Correction	0x23c	572	Table	6	Showerhead pulse end point, ET based
2nd Fuel Pulse Endpoint Throttle Correction	0x242	578	Table	6	Showerhead pulse end point, load based
Table Lock Value	0x280	640	Value	2	
AFV Storage Delay	0x282	642	Value	1	Time between AFV writes to EEPROM
Global Spark Advance	0x285	645	Value	1	Global spark advance adjustment
Timed Spark Adjust Minimum RPM	0x286	646	Value	2	Minimum RPM to enable spark advance adjusting
Idle Spark Advance Temperature Adjustment	0x294	660	Table	8	Idle spark advance temperature correction
WOT Spark Advance Reduction	0x2c0	704	Table	8	WOT spark advance reduction
Air Temperature Spark Retard Configuration	0x2d7	727	Bits	1	Air Temp Retard Configuration
Air Temperature Spark Advance Reduction Scaling	0x2d8	728	Table	14	Air temp spark retard
VSS Input Minimum Frequency	0x2e7	743	Value	1	Minimum valid VSS input frequency
VSS Input Scaling Factor	0x2e8	744	Value	2	Scale factor for VSS input
VSS Output Scaling Factor	0x2ea	746	Value	2	Scale factor for VSS output
VS-RPM Ratio VS Sampling Time	0x2ec	748	Value	1	Time to count speed sensor pulses
Speed-RPM Ratio RPM Sample Duration	0x2ed	749	Value	1	Sample period for Speed-RPM ratio
VSS Ratio Gearing Table	0x2ee	750	Array	6	Gear selection
Spark Advance Retard Configuration	0x2f4	756	Bits	1	Spark advance and fuel reduction configuration
Spark Advance Retard Minimum Engine Temperature	0x2f5	757	Value	1	Minimum engine temperature to enable reduction
Spark Advance Reduction Upper RPM Boundary	0x32e	814	Array	7	Maximum RPM to enable reduction
Spark Advance Reduction Lower RPM boundary	0x335	821	Array	7	Minimum RPM to enable reduction
Spark Advance Reduction Fuel Correction	0x33c	828	Array	7	Fuel correction during activation

BUE2D (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Spark Advance Reduction	0x343	835	Array	7	The spark advance reduction while noise abatement is active
Spark Advance Reduction Ramp-In Duration	0x34a	842	Array	7	Spark advance reduction ramp-in duration
Spark Advance Reduction Hold Duration	0x351	849	Array	7	Spark advance reduction hold duration
Spark Advance Reduction Ramp-Out Duration	0x358	856	Array	7	Spark advance reduction ramp-out duration
Active Intake Configuration	0x35f	863	Bits	1	Active intake controller setup
Active Intake Gearing	0x360	864	Bits	1	Active intake gearing configuration byte
Active Intake Period	0x361	865	Value	1	Active intake control period
Active Intake Ramp In Duty Cycle	0x362	866	Value	1	Active intake ramp-in period duty cycle
Active Intake Hold Duty Cycle	0x363	867	Value	1	Active intake hold period duty cycle
Active Intake Ramp Out Duty Cycle	0x364	868	Value	1	Active intake ramp-out period duty cycle
Active Intake Gearing	0x385	901	Bits	1	Active intake gearing configuration byte
RPM Fixed Limit Cold Start Ramp	0x386	902	Value	1	Temperature delta to ramp from cold RPM limits
Soft Limit Ignition Pattern Front	0x387	903	Bits	1	Front Soft Limit Fire Pattern
Soft Limit Ignition Pattern Rear	0x388	904	Bits	1	Rear Soft Limit Fire Pattern
Hard Limit Ignition Pattern Front	0x389	905	Bits	1	Front Hard Limit Fire Pattern
Hard Limit Ignition Pattern Rear	0x38a	906	Bits	1	Rear Hard Limit Fire Pattern
RPM Fixed Soft Limit Trigger for Cold Engine	0x38b	907	Value	1	Cold engine soft RPM limit, high
RPM Fixed Soft Limit Recharge for Cold Engine	0x38c	908	Value	1	Cold engine soft RPM limit, low
RPM Fixed Hard Limit Trigger for Cold Engine	0x38d	909	Value	1	Cold engine hard RPM limit, high
RPM Fixed Hard Limit Recharge for Cold Engine	0x38e	910	Value	1	Cold engine hard RPM limit, low
RPM Fixed Soft Limit Trigger	0x38f	911	Value	1	Fixed soft limit trigger RPM
RPM Fixed Soft Limit Recharge	0x390	912	Value	1	Fixed soft limit release RPM
RPM Fixed Hard Limit Trigger	0x391	913	Value	1	Fixed hard limit trigger RPM
RPM Fixed Hard Limit Recharge	0x392	914	Value	1	Fixed hard limit release RPM
RPM Fixed Kill Limit Trigger	0x393	915	Value	1	Kill limit trigger RPM
RPM Fixed Kill Limit Recharge	0x394	916	Value	1	Kill limit release RPM
RPM High Speed Hysteresis High Value	0x395	917	Value	1	High speed speed-RPM ration hysteresis, upper value
RPM High Speed Hysteresis Low Value	0x396	918	Value	1	High speed speed-RPM ration hysteresis, lower value
RPM High Speed Timed Limit Timer Start	0x397	919	Value	1	RPM threshold to start limit timer at high speed
RPM High Speed Timed Limit Timer Reset	0x398	920	Value	1	RPM threshold to reset limit timer at high speed
RPM High Speed Timed Hard Limit	0x399	921	Value	1	RPM threshold to enable delayed hard limit at high speed
RPM High Speed Timed Soft Limit	0x39a	922	Value	1	RPM threshold to enable delayed soft limit at high speed
RPM High Speed Timed Soft Limit Delay	0x39b	923	Value	1	Soft limit delay at high speed
RPM High Speed Timed Hard Limit Delay	0x39c	924	Value	1	Hard limit delay at high speed
RPM Low Speed Timed Limit Timer Start	0x39d	925	Value	1	RPM threshold to start limit timer at low speed
RPM Low Speed Timed Limit Timer Reset	0x39e	926	Value	1	RPM threshold to reset limit timer at low speed
RPM Low Speed Timed Hard Limit	0x39f	927	Value	1	RPM threshold to enable delayed hard limit at low speed
RPM Low Speed Timed Soft Limit	0x3a0	928	Value	1	RPM threshold to enable delayed soft limit at low speed

BUE2D (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
RPM Low Speed Timed Soft Limit Delay	0x3a1	929	Value	1	Soft limit delay at low speed
RPM Low Speed Timed Hard Limit Delay	0x3a2	930	Value	1	Hard limit delay at low speed
Temperature Soft Limit Minimum Load	0x3a3	931	Value	1	Load above which soft temp limit enabled
Temperature Soft Limit Minimum RPM	0x3a4	932	Value	1	Minimum RPM to enable temperature soft limit
Temperature Hard Limit Minimum Load	0x3a5	933	Value	1	Load above which hard temp limit enabled
Temperature Hard Limit Minimum RPM	0x3a6	934	Value	1	Minimum RPM to enable temperature hard limit
Temperature Soft Limit Trigger	0x3a7	935	Value	1	Temperature threshold to trigger soft limit
Temperature Soft Limit Recharge	0x3a8	936	Value	1	Temperature threshold to recharge soft limit
Temperature Hard Limit Trigger	0x3a9	937	Value	1	Temperature trheshold to trigger hard limit
Temperature Hard Limit Recharge	0x3aa	938	Value	1	Temperature threshold to recharge hard limit
Ignore Minimum RPM Trigger	0x3ab	939	Value	1	Temperature threshold indicating to ignore RPM/throttle limits
Ignore Minimum RPM Recharge	0x3ac	940	Value	1	Temperature threshold indicating to obey RPM/throttle limits
Temperature Kill Limit Trigger	0x3ad	941	Value	1	Temperature trheshold to trigger hard limit
Temperature Kill Limit Recharge	0x3ae	942	Value	1	Temperature threshold to recharge kill limit
Temperature Limit Engine Lamp On Value	0x3af	943	Value	1	Temperature threshold to switch on engine lamp
Temperature Limit Engine Lamp Off Value	0x3b0	944	Value	1	Temperature threshold to switch off engine lamp
Fan Configuration	0x3c9	969	Bits	1	Fan Configuration
Fan Key-On Off Temperature	0x3ca	970	Value	1	Temperature threshold to switch off fan
Fan Key-On On Temperature	0x3cb	971	Value	1	Temperature threshold to switch on fan
Fan Key-On Duty Cycle	0x3cc	972	Table	8	Fan key-on duty cycle
Fan Duty Cycle Period	0x3f4	1012	Value	1	Cooling Fan Control Period
Fan Key-Off Run Delay	0x3f5	1013	Value	1	Key-off delay before starting fan
Fan Key-Off Run Duty Cycle	0x3f6	1014	Value	1	Fan duty cycle after key-off
Fan Key-Off On Temperature	0x3f7	1015	Value	1	Key-off temperature threshold to switch off fan
Fan Key-Off Off Temperature	0x3f8	1016	Value	1	Key-off temperature threshold to switch on fan
Fan Key-Off Maximum Duration	0x3f9	1017	Value	1	Maximum time running fan after key-off
Fan Key-Off Minimum Battery Voltage	0x3fa	1018	Value	1	Minimum battery voltage to run fan after key-off
Fan 2 Delay	0x3fb	1019	Value	1	Delay before switching on fan 2 after turning on fan 1
Active Muffler Configuration	0x3fc	1020	Bits	1	Active Muffler Valve Configuration
Active Muffler WOT Condition Hysteresis	0x3fd	1021	Value	1	Active exhaust valve WOT condition hysteresis
Active Muffler Motor Minimum On Time	0x3fe	1022	Value	1	Active exhaust valve controller minimum on-time
Active Muffler Motor Minimum Off Time	0x3ff	1023	Value	1	Active exhaust valve controller minimum off-time
Fan Duty Cycle Map Temperature Axis	0x400	1024	Axis	4	Engine temperature axis for fan duty cycle map
Fan Duty Cycle Map Battery Axis	0x404	1028	Axis	8	Battery voltage axis for fan duty cycle map
Fan Duty Cycle Map	0x40c	1036	Map	16	Fan duty cycle map for battery and engine temperature
Fan Key-On On Temperature Table	0x41c	1052	Table	8	Key-on fan on temp based on battery voltage
Fan Key-On Off Temperature Table	0x424	1060	Table	8	Key-on fan off temp based on battery voltage
Fan On Temperature Table with Key-Off	0x42c	1068	Table	8	Key-off fan on temp based on battery voltage
Fan Off Temperature Table with Key-Off	0x434	1076	Table	8	Key-off fan off temp based on battery voltage

BUE2D (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Minimum Battery Voltage with Key-Off	0x43c	1084	Table	8	Min bat for fuel pump and fans after key-off
Active Muffler Valve Switching Points	0x44e	1102	Axis	6	Active exhaust valve switching RPMs
Shifter Configuration	0x48e	1166	Bits	1	Shifter Configuration
Shifter Input	0x48f	1167	Value	1	Input pin to activate shifter feature
Shifter Input Activation Level	0x490	1168	Value	1	Shifter feature activation level
Shifter Input Debounce Time	0x491	1169	Value	1	Shifter feature debounce time
Shifter Input Minimum Delay	0x492	1170	Value	1	Min time between shifts
Shifter Interrupt Duration	0x495	1173	Array	7	Length of shift interrupt
Shift Light Configuration	0x49c	1180	Bits	1	Shift Light Configuration
Shift Light Flashing Period	0x49d	1181	Value	1	Shift light on time while flashing
Shift Light Flashing RPM Hysteresis High	0x49e	1182	Array	7	Shift Light flashing above this speed
Shift Light Flashing RPM Hysteresis Low	0x4a5	1189	Array	7	Shift Light stops flashing below this speed
Shift Light On RPM Hysteresis High	0x4ac	1196	Array	7	Shift Light on above this speed
Shift Light Off RPM Hysteresis Low	0x4b3	1203	Array	7	Shift Light off below this speed
Starter Interlock Configuration	0x4ba	1210	Bits	1	Starter Interlock Configuration
Sidestand Interlock Signal Threshold	0x4bb	1211	Value	1	Threshold for sidestand input
Starter Relay Maximum RPM Hysteresis High	0x4bc	1212	Value	1	Max RPM for starter relay (upper hysteresis)
Starter Relay Maximum RPM Hysteresis Low	0x4bd	1213	Value	1	Max RPM for starter relay (lower hysteresis)
Sidestand Interlock Maximum Speed	0x4be	1214	Value	1	Sidestand interlock disabled after reaching speed
Sidestand Input Number of Errors	0x4bf	1215	Value	1	Sidestand extended at high speed before failure
Sidestand Input Maximum Reading Allowed	0x4c0	1216	Value	1	Upper limit of sidestand input
Sidestand Input Minimum Reading Allowed	0x4c1	1217	Value	1	Lower limit of sidestand input
Idle Air Control Configuration	0x4c2	1218	Bits	1	Idle air control setup
Idle Air Control Average Maximum Value	0x4d2	1234	Value	1	Maximum value for idle air control moving average
Idle Air Control Average Minimum Value	0x4d3	1235	Value	1	Minimum value for idle air control moving average
Idle Air Control Moving Average Factor	0x4d6	1238	Value	1	Idle air control factor to set up moving average
Idle Air Control Average Maxiumum Engine Temperature	0x4d7	1239	Value	1	Maximum engine temperature for idle air control moving average
Idle Air Control Average Minimum Engine Temperature	0x4d8	1240	Value	1	Minimum engine temperature for idle air control moving average
Idle Air Control Key-On Position	0x51a	1306	Table	8	IAC position for startup
IAC Setpoint Map Temperature Axis	0x52e	1326	Axis	6	Engine temperature axis for IAC setpoint map
IAC Setpoint Map Battery Axis	0x534	1332	Axis	8	Battery voltage axis for IAC setpoint map
IAC Setpoint Map	0x53c	1340	Map	24	IAC RPM setpoint map for battery voltage and engine temperature
Idle Air Control Startup Correction	0x554	1364	Table	4	IAC RPM setpoint correction for startup
Idle Air Control Throttle Position Adjustment	0x558	1368	Table	16	Throttle position adjustment table for IAC position
Idle Air Control TP Adjustment Scaling	0x568	1384	Table	16	Scaling of IAC throttle position adjustment for throttle position load
CAN Bus Configuration	0x583	1411	Bits	1	CAN bus setup
Global Fuel Scale Increment	0x584	1412	Value	1	Incremental Fuel scale, time per unit of fuel

BUE2D (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Cold Start Condition	0x589	1417	Value	1	Engine temperature indicates a cold engine condition. The CAN cold flag is set and cold engine RPM limit apply.
Aux Power Relay Configuration	0x5a2	1442	Bits	1	Aux Power Relay Configuration
Aux Power Relay On Battery Voltage	0x5a3	1443	Value	1	Battery voltage above which aux relay turned on
Aux Power Relay Off Battery Voltage	0x5a4	1444	Value	1	Battery voltage below which aux relay turned off
Aux Power Relay Switching Delay	0x5a5	1445	Value	1	Delay before switching aux relay
Spark Plug Cleaning Configuration	0x5a6	1446	Bits	1	Spark Plug Cleaning Configuration
Spark Plug Cleaning Maximum Engine Temperature	0x5a8	1448	Value	1	No plug cleaning needed if TE exceeds this
Spark Plug Cleaning Waste Fire Maximum Engine Temperature	0x5a9	1449	Value	1	Terminate plug cleaning waste fires above this TE
Spark Plug Cleaning Engine Minimum Run Time	0x5aa	1450	Value	1	Min time for engine run event for plug cleaning
Spark Plug Cleaning Number of Cold Runs	0x5ab	1451	Value	1	Cold run events before plug cleaning needed
Spark Plug Key-On Cleaning Time	0x5ad	1453	Value	1	Duration of key-on plug cleaning
Spark Plug Cleaning Number of Waste Fires	0x5ae	1454	Value	1	Plug cleaning waste fires per rev
Fuel Pressure Control Configuration	0x5d2	1490	Bits	1	Fuel Pressure Control Configuration
Fuel Pressure Key-Off Minimum Pressure	0x5e8	1512	Table	6	Minimum fuel pressure when engine off
Fuel Pressure Setpoint for Startup	0x5f6	1526	Table	4	Fuel Pressure setpoint at startup
Fuel Pressure Setpoint for Engine Temperature	0x5fa	1530	Table	28	Fuel pressure setpoint table for engine temperature
Fuel Pressure Sensor Conversion Table	0x616	1558	Table	28	Fuel pressure sensor data
Fuel Pressure Setpoint Load Axis	0x632	1586	Axis	6	Load axis for fuel pressure setpoint map
Fuel Pressure Setpoint RPM Axis	0x638	1592	Axis	12	RPM axis for fuel pressure setpoint map
Fuel Pressure Setpoint	0x644	1604	Map	36	Fuel pressure setpoint map for RPM and load
Voltage and Fuel Pressure Correction Temperature Axis	0x668	1640	Axis	6	Fuel pressure axis for voltage and fuel pressure correction map
Voltage and Fuel Pressure Correction Battery Axis	0x66e	1646	Axis	12	Battery axis for voltage and fuel pressure correction map
Voltage and Fuel Pressure Correction	0x67a	1658	Map	36	Injector adder based on fuel pressure and battery
Fuel Pressure Correction	0x69e	1694	Table	8	Fuel Pressure correction
Rides Required to Clear DTC	0x6bc	1724	Value	1	Number of rides without error codes set to clear store errors
Throttle Position Sensor Number of Errors	0x6bd	1725	Value	1	Number of TPS read failures before error code is set
Throttle Position Sensor Highest Reading Allowed	0x6be	1726	Value	2	Maximum TPS reading
Throttle Position Sensor Lowest Reading Allowed	0x6c0	1728	Value	2	Minimum TPS reading
Throttle Position Sensor Default Value	0x6c2	1730	Value	2	TPS default value set on failure
O2 Sensor Test Minimum RPM	0x6c4	1732	Value	2	Minimum RPM to check for O2 activity
O2 Sensor Test Minimum Throttle	0x6c6	1734	Value	1	Minimum throttle to check for O2 activity
O2 Sensor Number of Errors	0x6c7	1735	Value	1	Number of O2 sensor read failures before error code is set
O2 Sensor Number of Inactive Reads	0x6c8	1736	Value	1	Number of inactive results before error code is set
Engine Temperature Sensor Number of Errors	0x6c9	1737	Value	1	Number of ET sensor read failures before error code is set

BUE2D (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Engine Temperature Sensor Highest Reading Allowed	0x6ca	1738	Value	1	Maximum ET sensor reading
Engine Temperature Sensor Lowest Reading Allowed	0x6cb	1739	Value	1	Minimum ET sensor reading
Engine Temperature Sensor Default Value	0x6cc	1740	Value	1	ET sensor default value set on failure
Air Temperature Sensor Highest Reading Allowed	0x6cd	1741	Value	1	Maximum allowed air temperature sensor reading
Air Temperature Sensor Lowest Reading Allowed	0x6ce	1742	Value	1	Minimum allowed air temperature sensor reading
Air Temperature Sensor Default Value	0x6cf	1743	Value	1	Air temperature sensor default value, set on failure
Air Temperature Sensor Number of Errors	0x6d0	1744	Value	1	Number of air temperature sensor test failures before error code is set
Battery Average Voltage Difference Limit	0x6d5	1749	Value	1	Maximum difference allowed between average high and low battery voltage
Battery Voltage Test Minimum RPM	0x6d6	1750	Value	1	Minimum engine speed to perform battery voltage tests
Battery Voltage Number of Errors	0x6d7	1751	Value	1	Number of battery voltage test failures before error code is set
Battery Voltage Highest Reading Allowed	0x6d8	1752	Value	2	Battery voltage maximum reading allowed
Battery Voltage Lowest Reading Allowed	0x6da	1754	Value	2	Battery voltage minimum reading allowed
Battery Voltage Default Value	0x6dc	1756	Value	2	Battery voltage default value, set on failure
Active Muffler Controller Number of Tests Failed	0x6de	1758	Value	1	Number of AMC test failures before error code is set
Active Muffler Controller Max Feedback Time	0x6df	1759	Value	1	Maximum time allowed for AMC feedback
Active Intake Maximum TPS Reading Allowed	0x6e0	1760	Value	1	Maximum TPS reading while AIC is active
Active Intake Error Counts	0x6e1	1761	Value	1	Number of failed active intake tests before setting an error code
Active Intake Feedback Timeout	0x6e2	1762	Value	1	Active Intake Control feedback timeout
Injector Feedback Highest Reading Allowed	0x6e3	1763	Value	1	Maximum injector feedback reading
Injector Feedback Lowest Reading Allowed	0x6e4	1764	Value	1	Minimum injector feedback reading
Injector Feedback Number of Errors	0x6e5	1765	Value	1	Number of injector feedback test failures before error code is set
Coil Feedback Highest Reading Allowed	0x6e6	1766	Value	1	Maximum allowed coil feedback reading
Coil Feedback Lowest Reading Allowed	0x6e7	1767	Value	1	Minimum allowed coil feedback reading
Coil Feedback Number of Errors	0x6e8	1768	Value	1	Number of failed coil feedback tests before error code is set
Clutch Test Number of VSS Samples	0x6e9	1769	Value	1	Number of vehicle speed samples for clutch diagnostic tests
Clutch Test Minimum Load	0x6ea	1770	Value	1	Minimum load to run clutch diagnostic tests
Clutch Test Timeout	0x6eb	1771	Value	1	Number of failed clutch diagnostic tests before error code is set
Neutral Test Number of VSS Samples	0x6ec	1772	Value	1	Number of vehicle speed samples for neutral diagnostic tests
Neutral Test Minimum Load	0x6ed	1773	Value	1	Minimum load for neutral diagnostic
Neutral Test Timeout	0x6ee	1774	Value	1	Neutral diagnostic timeout
Fuel Pump Feedback Upper Limit	0x6ef	1775	Value	1	Maximum fuelpump feedback reading
Fuel Pump Feedback Off Time before Test	0x6f0	1776	Value	1	Off time before fuel pump feedback checked
Fuel Pump Feedback Number of Errors	0x6f1	1777	Value	1	Number of fuelpump feedback test failures before error code is set

BUE2D (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Idle Air Control Position Test Maximum Engine Temperature	0x6f5	1781	Value	1	Maximum engine temperature to test idle air control position
Idle Air Control Position Test Limit High	0x6f6	1782	Value	1	IAC position high diagnostic limit (255 disables)
Idle Air Control Position Test Limit Low	0x6f7	1783	Value	1	IAC position low diagnostic limit
Idle Air Control Highest Reading Allowed	0x6f8	1784	Value	1	IAC high position limit
Idle Air Control Lowest Reading Allowed	0x6f9	1785	Value	1	IAC low position limit
Idle Air Control Position Test Timeout	0x6fa	1786	Value	1	Idle air control position diagnostic timeout
Idle Air Control Test Timeout	0x6fb	1787	Value	1	IAC diagnostic timeout
Tacho Feedback Number of Errors	0x6fc	1788	Value	1	Number of tacho feedback test failures before error code is set
Fan Feedback Off Time before Test	0x6fd	1789	Value	1	Fan off-time before running feedback test
Fan Feedback Number of Errors	0x6fe	1790	Value	1	Number of failed fan tests before error code is set
VSS Output Test Timeout	0x6ff	1791	Value	1	Vehicle Speed Ouptut diagnostic timeout
VSS Input Test Minimum RPM	0x700	1792	Value	1	Minimum engine speed for VS input diagnostic
VSS Input Test Minimum Load	0x701	1793	Value	1	Minimum load for VS input diagnostic
VSS Input Test Timeout	0x702	1794	Value	1	Vehicle Speed Input diagnostic timeout
Bank Angle Sensor Highest Reading Allowed	0x705	1797	Value	1	Maximum bank angle sensor reading allowed (also: shifter configuration)
Bank Angle Sensor Tip-Over Value	0x706	1798	Value	1	Bank angle sensor tip-over value (also: shifter minimum delay between activations)
Bank Angle Sensor Lowest Reading Allowed	0x707	1799	Value	1	Minimum bank angles sensor reading allowed (also: shifter debounce period)
Bank Angle Sensor Number of Errors	0x708	1800	Value	1	Number of bank angle sensor test failures before error code is set (also: shifter fuel cut duration)
Bank Angle Sensor Tipover Delay	0x709	1801	Value	1	Bank angle sensor tip-over detection delay (also: shifter maximum input activation value)
Starter Relay Test Timeout	0x70a	1802	Value	1	Starter Relay diagnostic timeout
Aux Power Relay Test Feedback Timeout	0x70b	1803	Value	1	Auxiliary Power Relay diagnostic timeout
EEPROM Test Number of Errors	0x70c	1804	Value	1	Number of failed EEPROM checksum tests before error code set
AD-Converter Number of Errors	0x70d	1805	Value	1	Number of failed A/D conversion tests before error code set
Camshaft Sensor Test Minimum RPM	0x70e	1806	Value	2	Minimum RPM to set lost sync error
Camshaft Sensor Number of Sync Errors	0x710	1808	Value	1	Number of revs without sync detected before error code set
Camshaft Sensor Test Number of Consecutive Sync Errors	0x711	1809	Value	1	Number of consecutive out-of-sync revs before error code set
AFV Cylinder Difference Limit	0x715	1813	Value	1	Learned Fuel Cylinder Difference limit
AFV Cylinder Difference Number of Errors	0x716	1814	Value	1	Learned Fuel Cylinder Difference timeout
MAP Sensor Highest Reading Allowed	0x717	1815	Value	1	Highest MAP sensor reading allowed
MAP Sensor Lowest Reading Allowed	0x718	1816	Value	1	Lowest MAP sensor reading allowed
MAP Sensor Default Value	0x719	1817	Value	1	Default MAP value set on failure
Map Sensor Number of Errors	0x71a	1818	Value	1	Number of MAP sensor read failures before error code is set
Barometric Pressure Sensor Highest Reading Allowed	0x71b	1819	Value	1	Barometric pressure sensor maximum reading allowed
Barometric Pressure Sensor Lowest Reading Allowed	0x71c	1820	Value	1	Barometric pressure sensor mininmum reading allowed
Barometric Pressure Sensor Configuration	0x71d	1821	Value	1	Barometric pressure sensor default value, set on failure

BUE2D (DDFI-3)					
Name	Offset (hex)	Offset (dec)	Type	Size (bytes)	Description
Barometric Pressure Sensor Number of Errors	0x71e	1822	Value	1	Number of barometric pressure sensor test failures before error code is set
Error Mask Byte 0	0x729	1833	Bits	1	Diagnostic trouble code mask, byte 0
Error Mask Byte 1	0x72a	1834	Bits	1	Diagnostic trouble code mask, byte 1
Error Mask Byte 2	0x72b	1835	Bits	1	Diagnostic trouble code mask, byte 2
Error Mask Byte 3	0x72c	1836	Bits	1	Diagnostic trouble code mask, byte 3
Error Mask Byte 4	0x72d	1837	Bits	1	Diagnostic trouble code mask, byte 4
Error Mask Byte 5	0x72e	1838	Bits	1	Diagnostic trouble code mask, byte 5
Error Mask Byte 6	0x72f	1839	Bits	1	Diagnostic trouble code mask, byte 6
Error Mask Byte 7	0x730	1840	Bits	1	Diagnostic trouble code mask, byte 7
Error Mask Byte 8	0x731	1841	Bits	1	Diagnostic trouble code mask, byte 8
Error Mask Byte 9	0x732	1842	Bits	1	Diagnostic trouble code mask, byte 9
Error Mask Byte 10	0x733	1843	Bits	1	Diagnostic trouble code mask, byte 10
Dwell Duration	0x735	1845	Array	17	Dwell duration table
Timing Table Load Axis	0x746	1862	Axis	10	Timing table load axis (y-axis)
Timing Table RPM Axis	0x750	1872	Axis	28	Timing table RPM axis (x-axis)
Fuel Map Load Axis	0x76c	1900	Axis	16	Fuel load axis
Fuel Map RPM Axis	0x77c	1916	Axis	40	Fuel RPM axis
2nd Fuel Map Load Axis	0x7a4	1956	Axis	8	Secondary injector load axis
2nd Fuel Map RPM Axis	0x7ac	1964	Axis	24	Secondary injector RPM axis
Timing Table Front	0x800	2048	Map	140	Timing table front cylinder
Timing Table Rear	0x88c	2188	Map	140	Timing table rear cylinder
Fuel Map Front	0x918	2328	Map	320	Front fuel table
Fuel Map Rear	0xa58	2648	Map	320	Fuel map rear cylinder
2nd Fuel Map Front	0xb98	2968	Map	96	Front showerhead table
2nd Fuel Map Rear	0xbf8	3064	Map	96	Rear showerhead injectors
Air Temperature Maximum Spark Advance Reduction	0xc58	3160	Map	140	Maximum TA spark retard
TP to Load Table TP Axis	0xd04	3332	Axis	8	Throttle position axis for TP to load conversion map
TP to Load Table RPM Axis	0xd0c	3340	Axis	16	RPM axis for TP to load conversion map
TP to Load Table	0xd1c	3356	Map	64	Throttle position axis for TP to load conversion map
MAP to Load Table MAP Axis	0xd5c	3420	Axis	8	MAP axis for MAP to load conversion map
MAP to Load Table RPM Axis	0xd64	3428	Axis	16	RPM axis for MAP to load conversion map
MAP to Load Table Front	0xd74	3444	Map	64	Convert front MAP to load
MAP to Load Table Rear	0xdb4	3508	Map	64	Convert rear MAP to load
TP to Load Weight Table TP Axis	0xdf4	3572	Axis	8	Throttle position axis for TP to load weight map
TP to Load Weight Table RPM Axis	0xdfc	3580	Axis	16	RPM axis for TP to load weight map
TP to Load Weight Table	0xe0c	3596	Map	64	Weight of TPS (vs MAP) in load calculation

21 Appendix L - Realtime parameters – datalogging

21.1 DDFI and DDFI-2

Offset	Name	Type	Units	Size (bytes)	Factor	Delta	ECMSpy export name
0	SOH	Scalar		1	1	0	SOH
1	SRC	Scalar		1	1	0	SRC
2	DST	Scalar		1	1	0	DST

Offset	Name	Type	Units	Size (bytes)	Factor	Delta	ECMSpy export name
3	Len	Scalar		1	1	0	Len
4	EOH	Scalar		1	1	0	EOH
5	SOT	Scalar		1	1	0	SOT
6	ACK	Scalar		1	1	0	ACK
7	System Configuration	Bitfield		1	1	0	SysConfig
8	10 Millisecond Time	Scalar	Seconds	1	0.01	0	MilliSec
9	Seconds	Scalar	Seconds	2	1	0	Seconds
11	Engine Speed	Scalar	RPM	2	1	0	RPM
13	Spark Advance Front	Scalar	Degrees	2	0.0025	0	spark1
15	Spark Advance Rear	Scalar	Degrees	2	0.0025	0	spark2
17	Raw Table Fuel, Front	Scalar		2	1	0	veCurr1_RAW
17	Table Fuel, Front	Scalar	Milliseconds	2	0.00133	0	veCurr1
19	Raw Table Fuel, Rear	Scalar		2	1	0	veCurr2_RAW
19	Table Fuel, Rear	Scalar	Milliseconds	2	0.00133	0	veCurr2
21	Fuel Pulsewidth Front	Scalar	Milliseconds	2	0.00133	0	pw1
23	Fuel Pulsewidth Rear	Scalar	Milliseconds	2	0.00133	0	pw2
25	Throttle Position Degrees	Scalar	Degrees	2	0.1	0	TPD
27	Load Rear	Scalar	8-bit	1	1	0	Load2
27	Throttle Percentage	Scalar	8-bit	1	0.392157	0	TPS%
28	Battery Voltage	Scalar	Volts	2	0.01	0	Batt. Voltg.
30	Engine Temperature Fahrenheit	Scalar	Fahrenheit	2	0.18	-40	CLT_F
30	Engine Temperature	Scalar	Degree C	2	0.1	-40	CLT
32	Air Temperature Fahrenheit	Scalar	Fahrenheit	2	0.18	-40	MAT_F
32	Air Temperature	Scalar	Degree C	2	0.1	-40	MAT
34	O2 Sensor Rear	Scalar	10-bit ADC	2	1	0	O2 ADC
34	O2 Voltage Rear	Scalar	Volt	2	0.004888	0	O2
38	Engine Temp Correction	Scalar	Percent	2	0.1	0	WUE
40	Air Temp Correction	Scalar	Percent	2	0.1	0	IAT Corr.
42	Acceleration Correction	Scalar	Percent	2	0.1	0	Accel Corr.
44	Deceleration Correction	Scalar	Percent	2	0.1	0	Decel Corr.
46	WOT Correction	Scalar	Percent	2	0.1	0	WOT Corr.
48	Idle Correction	Scalar	Percent	2	0.1	0	Idle Corr.
50	Open Loop Correction	Scalar	Percent	2	0.1	0	OL Corr.
52	AFV Rear	Scalar	Percent	2	0.1	0	AFV2
54	EGO Correction	Scalar	Percent	2	0.1	0	EGO2 Corr.
56	Flags Byte 0	Bitfield		1	1	0	Flags0
57	Flags Byte 1	Bitfield		1	1	0	Flags1
58	Flags Byte 2	Bitfield		1	1	0	Flags2
59	Flags Byte 3	Bitfield		1	1	0	Flags3
60	Flags Byte 4	Bitfield		1	1	0	Flags4
61	Flags Byte 5	Bitfield		1	1	0	Flags5

Offset	Name	Type	Units	Size (bytes)	Factor	Delta	ECMSpy export name
62	Flags Byte 6	Bitfield		1	1	0	Flags6
65	Bank Angle Sensor	Scalar	10-bit ADC	2	1	0	BAS ADC
65	BAS Voltage	Scalar	Volt	2	0.004888	0	BAS Voltg.
67	Current Errors Byte 1	Bitfield		1	1	0	CDiag0
68	Current Errors Byte 2	Bitfield		1	1	0	CDiag1
69	Current Errors Byte 3	Bitfield		1	1	0	CDiag2
70	Current Errors Byte 4	Bitfield		1	1	0	CDiag3
71	Recent Errors Byte 1	Bitfield		1	1	0	RDiag0
72	Recent Errors Byte 2	Bitfield		1	1	0	RDiag1
73	Recent Errors Byte 3	Bitfield		1	1	0	RDiag2
74	Recent Errors Byte 4	Bitfield		1	1	0	RDiag3
75	Stored Errors Byte 1	Bitfield		1	1	0	HDiag0
76	Stored Errors Byte 2	Bitfield		1	1	0	HDiag1
77	Stored Errors Byte 3	Bitfield		1	1	0	HDiag2
78	Stored Errors Byte 4	Bitfield		1	1	0	HDiag3
83	Rides	Scalar	Rides	1	1	0	Rides
84	Digital Output 1	Bitfield		1	1	0	DOut1
85	Digital Input	Bitfield		1	1	0	DIn
86	Coil Feedback Front	Scalar	8-bit ADC	1	1	0	Coil1 ADC
87	Coil Feedback Rear	Scalar	8-bit ADC	1	1	0	Coil2 ADC
88	Injector Feedback Front	Scalar	8-bit ADC	1	1	0	Inj1 ADC
89	Injector Feedback Rear	Scalar	8-bit ADC	1	1	0	Inj2 ADC
90	TPS 10Bit	Scalar	10-bit ADC	2	1	0	TPS 10Bit
90	TPS Voltage	Scalar	Volt	2	0.004888	0	TPS Voltg.
92	Battery Feedback	Scalar	10-bit ADC	2	1	0	Batt. ADC
94	Engine Temperature Sensor	Scalar	8-bit ADC	1	1	0	ETS ADC
94	ETS Voltage	Scalar	Volt	1	0.019608	0	ETS Voltg.
95	Air Temperature Sensor	Scalar	8-bit ADC	1	1	0	IAT ADC
95	IAT Voltage	Scalar	Volt	1	0.019608	0	IAT Voltg.
96	Fuel Pump Feedback	Scalar	8-bit ADC	1	1	0	FP ADC
97	Cooling Fan Feedback	Scalar	8-bit ADC	1	1	0	Fan ADC
98	Fan Duty Cycle	Scalar	Percent	1	1	0	Fan Duty
99	Speed MPH	Scalar	mph	1	1	0	speed mph
101	Current Errors Byte 5	Bitfield		1	1	0	CDiag4
102	Recent Errors Byte 5	Bitfield		1	1	0	RDiag4
103	Stored Errors Byte 5	Bitfield		1	1	0	HDiag4
105	End of Text	Scalar		1	1	0	EOT
106	Checksum	Scalar		1	1	0	CheckS.

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Offset	Name	Type	Units	Size (bytes)	Factor	Delta	ECMSpy export name
0	SOH	Scalar		1	1	0	SOH
1	SRC	Scalar		1	1	0	SRC
2	DST	Scalar		1	1	0	DST
3	Len	Scalar		1	1	0	Len
4	EOH	Scalar		1	1	0	EOH
5	SOT	Scalar		1	1	0	SOT
6	ACK	Scalar		1	1	0	ACK
7	Load Front	Scalar	Percent * 2.56	1	1	0	Load1
8	10 Millisecond Time	Scalar	Seconds	1	0.01	0	MilliSec
9	Seconds	Scalar	Seconds	2	1	0	Seconds
11	Engine Speed	Scalar	RPM	2	1	0	RPM
13	Spark Advance Front	Scalar	Degrees	2	0.0025	0	spark1
15	Spark Advance Rear	Scalar	Degrees	2	0.0025	0	spark2
17	Raw Table Fuel, Front	Scalar		2	1	0	veCurr1_RAW
17	Table Fuel, Front	Scalar	Milliseconds	2	0.00133	0	veCurr1
19	Raw Table Fuel, Rear	Scalar		2	1	0	veCurr2_RAW
19	Table Fuel, Rear	Scalar	Milliseconds	2	0.00133	0	veCurr2
21	Fuel Pulsewidth Front	Scalar	Milliseconds	2	0.00133	0	pw1
23	Fuel Pulsewidth Rear	Scalar	Milliseconds	2	0.00133	0	pw2
25	Throttle Position Degrees	Scalar	Degrees	2	0.1	0	TPD
27	Load Rear	Scalar	8-bit	1	1	0	Load2
28	Battery Voltage	Scalar	Volts	2	0.01	0	Batt. Voltg.
30	Engine Temperature Fahrenheit	Scalar	Fahrenheit	2	0.18	-40	CLT_F
30	Engine Temperature	Scalar	Degree C	2	0.1	-40	CLT
32	Air Temperature Fahrenheit	Scalar	Fahrenheit	2	0.18	-40	MAT_F
32	Air Temperature	Scalar	Degree C	2	0.1	-40	MAT
34	O2 Sensor Rear	Scalar	10-bit ADC	2	1	0	O2 ADC
34	O2 Voltage Rear	Scalar	Volt	2	0.004888	0	O2
36	Battery Voltage Correction	Scalar	Milliseconds	2	0.00133	0	Batt. Voltg. Cor
38	Engine Temp Correction	Scalar	Percent	2	0.1	0	WUE
40	Air Temp Correction	Scalar	Percent	2	0.1	0	IAT Corr.
42	Acceleration Correction	Scalar	Percent	2	0.1	0	Accel Corr.
44	Deceleration Correction	Scalar	Percent	2	0.1	0	Decel Corr.
46	MAP Front	Scalar	10-bit ADC	2	1	0	MAP1
46	WOT Correction	Scalar	Percent	2	0.1	0	WOT Corr.
48	Idle Correction	Scalar	Percent	2	0.1	0	Idle Corr.
48	MAP Rear	Scalar	10-bit ADC	2	1	0	MAP2
50	Open Loop Correction	Scalar	Percent	2	0.1	0	OL Corr.

Offset	Name	Type	Units	Size (bytes)	Factor	Delta	ECMSpy export name
52	AFV Rear	Scalar	Percent	2	0.1	0	AFV2
54	EGO Correction	Scalar	Percent	2	0.1	0	EGO2 Corr.
56	Flags Byte 0	Bitfield		1	1	0	Flags0
57	Flags Byte 1	Bitfield		1	1	0	Flags1
58	Flags Byte 2	Bitfield		1	1	0	Flags2
59	Flags Byte 3	Bitfield		1	1	0	Flags3
59	Throttle Percentage	Scalar	8-bit	1	0.392157	0	TPS%
60	ABP Average	Scalar	8-bit	1	1	0	Avg. Baro.
60	Average IAC Live Status	Scalar	Steps	1	1	0	Avg. IAC
60	Flags Byte 4	Bitfield		1	1	0	Flags4
60	Throttle and IAC Load	Scalar	Percent	1	1	0	TP IAC Load
61	Flags Byte 5	Bitfield		1	1	0	Flags5
62	Flags Byte 6	Bitfield		1	1	0	Flags6
63	Air-Fuel Sensor Front	Scalar	10-bit ADC	2	1	0	AF1 ADC
65	Air-Fuel Sensor Rear	Scalar	10-bit ADC	2	1	0	AF ADC
65	Bank Angle Sensor	Scalar	10-bit ADC	2	1	0	BAS ADC
65	BAS Voltage	Scalar	Volt	2	0.004888	0	BAS Voltg.
67	Current Errors Byte 1	Bitfield		1	1	0	CDiag0
68	Current Errors Byte 2	Bitfield		1	1	0	CDiag1
69	Current Errors Byte 3	Bitfield		1	1	0	CDiag2
70	Current Errors Byte 4	Bitfield		1	1	0	CDiag3
71	Current Errors Byte 5	Bitfield		1	1	0	CDiag4
72	Current Errors Byte 6	Bitfield		1	1	0	CDiag5
73	Current Errors Byte 7	Bitfield		1	1	0	CDiag6
74	Current Errors Byte 8	Bitfield		1	1	0	CDiag7
75	Stored Errors Byte 1	Bitfield		1	1	0	HDiag0
76	Stored Errors Byte 2	Bitfield		1	1	0	HDiag1
77	Stored Errors Byte 3	Bitfield		1	1	0	HDiag2
78	Stored Errors Byte 4	Bitfield		1	1	0	HDiag3
79	Stored Errors Byte 5	Bitfield		1	1	0	HDiag4
80	Stored Errors Byte 6	Bitfield		1	1	0	HDiag5
81	Stored Errors Byte 7	Bitfield		1	1	0	HDiag6
82	Stored Errors Byte 8	Bitfield		1	1	0	HDiag7
83	Rides	Scalar	Rides	1	1	0	Rides
84	Digital Output 1	Bitfield		1	1	0	DOut1
85	Digital Input	Bitfield		1	1	0	DIn
86	Coil Feedback Front	Scalar	8-bit ADC	1	1	0	Coil1 ADC
87	Coil Feedback Rear	Scalar	8-bit ADC	1	1	0	Coil2 ADC
88	Injector Feedback Front	Scalar	8-bit ADC	1	1	0	Inj1 ADC
89	Injector Feedback Rear	Scalar	8-bit ADC	1	1	0	Inj2 ADC
90	TPS 10Bit	Scalar	10-bit ADC	2	1	0	TPS 10Bit
90	TPS Voltage	Scalar	Volt	2	0.004888	0	TPS Voltg.

Offset	Name	Type	Units	Size (bytes)	Factor	Delta	ECMSpy export name
92	Battery Feedback	Scalar	10-bit ADC	2	1	0	Batt. ADC
94	Engine Temperature Sensor	Scalar	8-bit ADC	1	1	0	ETS ADC
94	ETS Voltage	Scalar	Volt	1	0.019608	0	ETS Voltg.
95	Air Temperature Sensor	Scalar	8-bit ADC	1	1	0	IAT ADC
95	IAT Voltage	Scalar	Volt	1	0.019608	0	IAT Voltg.
96	Fuel Pump Feedback	Scalar	8-bit ADC	1	1	0	FP ADC
97	Cooling Fan Feedback	Scalar	8-bit ADC	1	1	0	Fan ADC
98	Fan Duty Cycle	Scalar	Percent	1	1	0	Fan Duty
99	Speed KPH	Scalar	km/h	1	1	0	speed kph
99	Speed MPH	Scalar	mph	1	0.62137	0	speed mph
99	VSS	Scalar	Counts / Sample	1	1	0	VSS
100	Gear	Scalar		1	1	0	Gear
100	VSS_RPM	Scalar	Counts / Sample	1	1	0	VSS_RPM
101	Current Errors Byte 9	Bitfield		1	1	0	CDiag8
102	Current Errors Byte 10	Bitfield		1	1	0	CDiag9
103	Stored Errors Byte 9	Bitfield		1	1	0	HDiag8
104	Stored Errors Byte 10	Bitfield		1	1	0	HDiag9
105	Oil Temperature Sensor	Scalar	8-bit ADC	1	1	0	Oil ADC
105	Sidestand Feedback	Scalar	8-bit ADC	1	1	0	Sides. ADC
106	AFR Rear	Scalar	8-bit ADC	1	1	0	AFR2
106	Catalyst O2 Sensor	Scalar	8-bit ADC	1	1	0	Cat. O2 ADC
107	Engine Temp Sensor	Scalar	8-bit ADC	1	1	0	ETS1 ADC
109	AFR Front	Scalar	8-bit ADC	1	1	0	AFR1
110	O2 Sensor Front	Scalar	8-bit ADC	1	1	0	O21 ADC
110	O2 Voltage Front	Scalar	Volt	1	0.019608	0	O21
111	Baro Sensor	Scalar	8-bit ADC	1	1	0	Baro ADC
112	MAP Sensor Rear	Scalar	8-bit ADC	1	1	0	MAP2 ADC
113	Spare Feedback	Scalar	8-bit ADC	1	1	0	Spare ADC
114	Switched Ignition Feedback	Scalar	8-bit ADC	1	1	0	Ign. ADC
115	Digital Out 2	Bitfield		1	1	0	DOut2
116	Digital Out 2 Feedback	Bitfield		1	1	0	DOut2 Feedb.
117	Digital Out 2 Current Errors	Bitfield		1	1	0	CADiag
118	Digital Output 2 Recent Errors	Bitfield		1	1	0	RADiag
119	IAC RPM Setpoint	Scalar	RPM	1	10	0	IAC Setp.
120	IAC Position	Scalar	Steps	1	1	0	IAC Pos.
121	MAP Front	Scalar		1	1	0	MAP1
122	MAP Rear	Scalar		1	1	0	MAP2
123	ABP	Scalar	kPa (typical)	1	1	0	ABP
124	FP Duty Cycle	Scalar	Percent	1	1	0	FP Duty
125	FP Setpoint	Scalar	PSI	1	1	0	FP Setp.

Offset	Name	Type	Units	Size (bytes)	Factor	Delta	ECMSpy export name
126	Fuel Pressure	Scalar	PSI	1	0.5	0	FP
127	FP Correction	Scalar	Percent	1	1	0	FP Corr.
128	AFV Front	Scalar	Percent	2	0.1	0	AFV1
130	EGO Correction Front	Scalar	Percent	2	0.1	0	EGO1 Corr.
132	Stored Errors Byte 11	Bitfield		1	1	0	HDiag10
133	End of Text	Scalar		1	1	0	EOT
134	Checksum	Scalar		1	1	0	CheckS.