



FEATURE PACK V1/V1.1



FEATURE PACK V2/V2.1



User Instruction Manual (V2.1)

Table of Contents

Overview	3
Features Available in Feature Pack V1 (F Version):	3
Features Available in Feature Pack V2 (G Version).....	4
Features Available in Feature Pack V1.1 (H Version) and V2.1 (I Version)	4
Important	4
Nistune Board Programming.....	5
Getting Started.....	8
Loading Feature Pack base maps	10
Importing Tunes	11
Fan Control.....	12
Flex Fuel	14
Load Limiting [Anti Stall] (FP1.1, FP2.1)	21
Low Voltage Crank Adjustment (FP1.1, FP2.1)	23
Boost Control (FP2)	24
Launch Control.....	28
Flat Shifting (FP1.1 / FP2.1).....	31
Variable Cam Timing Output.....	34
Injection Latency Table (FP2)	35
Idle Fuel Adjustment (FP2).....	36

Overview

This is the overview of the Nistune feature packs. Feature pack offers enhanced features over the standard ECU for a selected range of vehicles.

Also available is Feature Pack 2 is for a select few vehicles (S14-S15 200SX, R34 Skyline, WC34 Stagea and BNR32 GTR) which adds some additional items.

The standard Nissan ECU code has been modified using patch code to provide the most customers requested features. We do plan to add more features when possible in the future.

Features Available in Feature Pack V1 (F Version):

- Launch control

Fuel cut, and ignition timing retard functions triggered using either speed or clutch switch input

- Total injection multiplier

Replaces using TP Injection Multiplier (K constant) for resizing injectors. Removes the need for rescaling TP in other maps inside the ECU (fuel, timing, O2 feedback, knock sensing, acceleration enrichment)

- Flex fuel support

Adding full functionality flex fuel and timing maps, flex fuel and timing content trims, and temperature enrichment trim tables). *Limited models only*

- Fan control adjustment

Nissan ECUs which have adjustable fan output can now control the speed and temperature ranges that the fans are operated in. *Limited models only*

- Minimum MAF voltage

Some Nissan ECUs contain a minimum MAF voltage which is hard coded. Nistune now provides a parameter for these models to lower the MAF voltage when using aftermarket MAFs.

- Added VCT functionality

Adding VCT solenoid functionality to existing ECU hardware, replacing the often unused EGR (Exhaust Gas Regulator) solenoid output. *Limited models only*

- Enhanced tuning simplicity

Remove warm and cold start enrichment tables (only a single enrichment table is now used). Remove knock maps (for fuel, timing etc)

Features Available in Feature Pack V2 (G Version)

- Boost Control with Ethanol adjustment

TPS and RPM indexed boost control tables which drive a boost control solenoid

Provides boost control by ethanol content for flex fuel vehicles running E85 or a mixture

Boost by gear (using standard and high gear boost duty tables)

Blended boost control (low ethanol uses low gear boost table, high ethanol uses high gear boost table)

- Injection Latency table

Replaces the linear injection duty calculation used in the Nissan ECU with a flexible voltage indexed table

- Idle fuel control

Replaces the use of only the fuel table when the vehicle is at idle, it will access the idle fuel table for better control

Features Available in Feature Pack V1.1 (H Version) and V2.1 (I Version)

These features will be gradually added to supported models on a case by case basis

- Crank Voltage Adjustment

Add extra enrichment for when the battery is low during cranking. Provides extra pulsewidth for Injector Dynamics and similar injectors during crank

- Max Load (TP) Limiting on Deceleration

Limit ECU load when the vehicle is decelerating, or when the turbo charger is still spinning and the driver is no longer accelerating

- Push in launch control

Only operate switched launch control with clutch switch engaged. Toggle operation is removed

- Flat shift control

Activate a flat shift rev limit using a clutch switch when throttle position is over a trigger point

Important

To use the Feature Pack updates, your board must be reflashed to contain updated ECU program code which contains these features.

This can be done by either:

- (a) Sending the board to Nistune Developments, PLMS Innovation or one of our distributors who has a Base Image Programmer for reprogramming boards
- (b) Purchasing a base image programmer (our retail pricing is \$150AUD plus shipping and transaction fees)

Nistune Board Programming

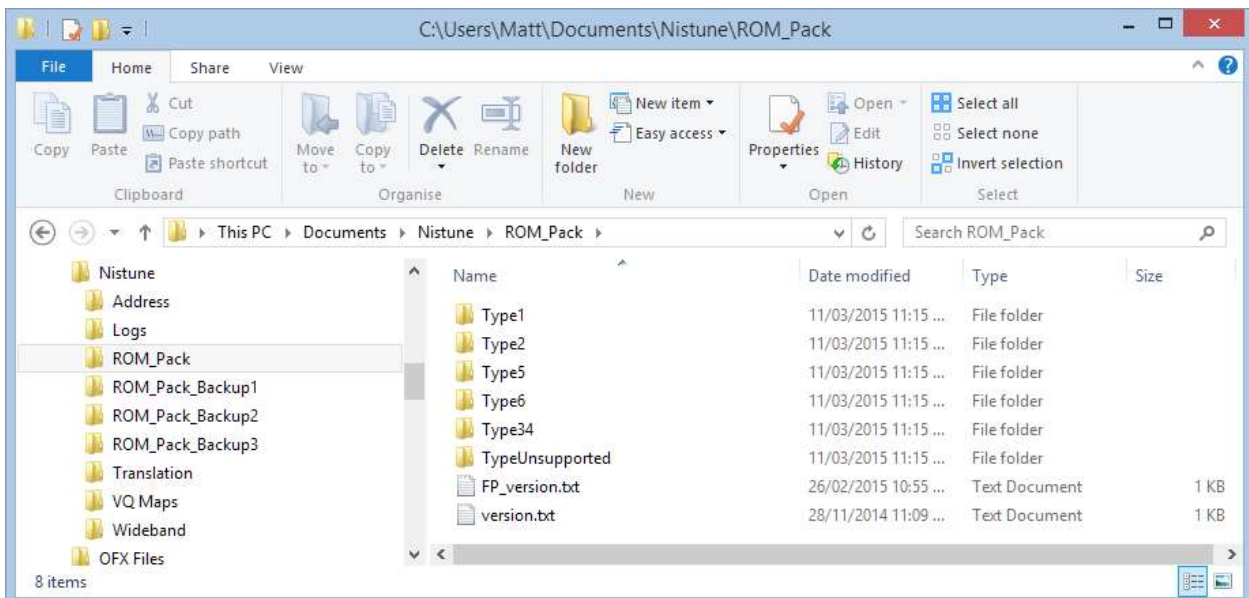
Note: Our boards use NVSRAM which use special sequences to save the contents with the NTProg software. No other type of programmer can be used to reprogram the Nistune board

The Nissan ECU code has been modified to add these extra features.

1. Visit our **Home > Support > Software Downloads** to grab the **Nistune FP 2.0 ROM pack**

The screenshot shows two download cards. The top card is for 'Nistune ROM File Pack 2.12 (EXE)' released on 9 Mar 2018. It lists 'Standard Nissan ROM files and Nistune ENT program files' and includes a note: 'ROM pack will move previous ROM packs to a backup folder. If your tunes were saved in the previous ROM pack location then we advise you move them to a separate folder.' The bottom card is for 'Nistune FP 2.0 ROM File Pack 2.9 (EXE)' released on 15 Oct 2018. It lists 'Install this in conjunction with the latest ROM pack', 'Extra features include inverted flex fuel function, cranking enrich flex fuel adjustment', and 'Extra vehicles supported'. Both cards have a 'Download File' button and a red arrow icon.

When you install this FP1 / FP2 ROM pack, it will add additional files to the standard Nistune ROM pack, containing the Nistune Feature Pack ENT (board programming files) and base tunes.



The ROM pack is normally located under Documents\Nistune\ROM_Pack

Note: **version.txt** and **fp_version.txt** are files which is used by the Nistune updater to determine what version of ROM pack you have loaded

2. When programming your Nistune board, choose the Feature Pack file matching the similar file name to your ECU part number.

All Nistune Feature Pack files will have 'F' as the last letter of the ECU part number. *For example: with a Z32 300ZX ECU with part number 41P13 use Feature Pack part number 41P1F*

+ Feature pack V1.1 will have 'H' as the last letter of the ECU part number

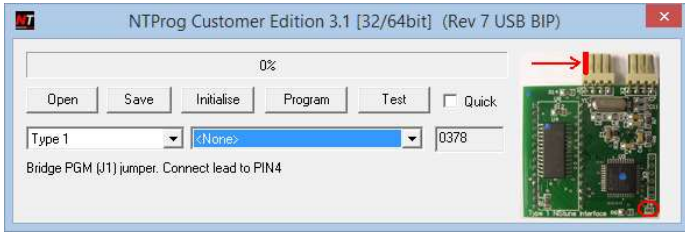
All Nistune Feature Pack 2 files will have 'G' as the last letter of the ECU part number. *For example: with an R34 GTT ECU with part number AA500 use Feature Pack part number AA50F*

+ Feature pack V2.1 will have 'I' as the last letter of the ECU part number

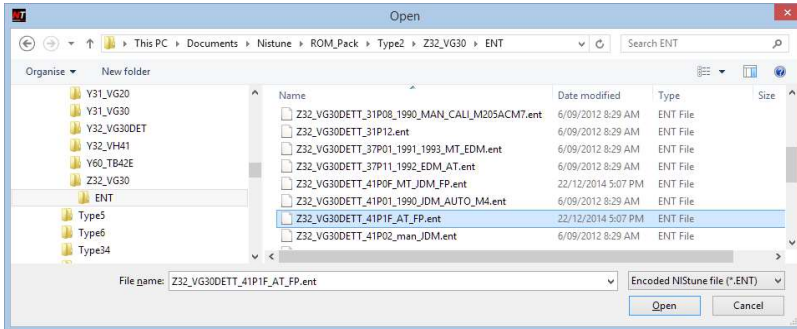
Details of compatibility are here:

<https://forum.nistune.com/viewtopic.php?f=12&t=2874>

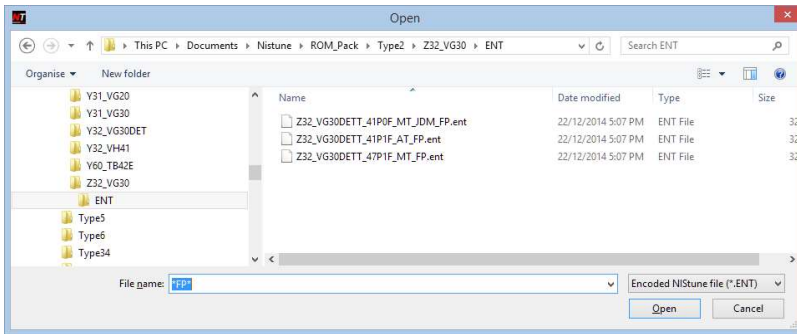
(a) Start Nistune Programmer (NTProg) as normal when programming your board



(b) Load in the matching ENT file for your board from the ROM pack. Remember that the file names end with 'FP' so look for these among the other files



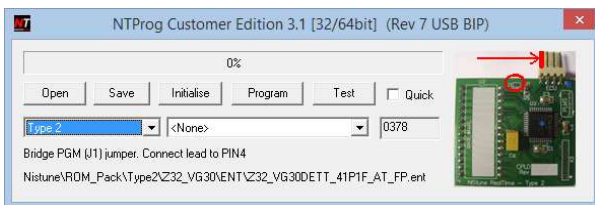
Hint: You can enter *FP* as the filename and press <ENTER> to filter the file names



If you cannot find a file for your ECU, you may be able to use a similar file (for example we use 41POF JDM ECU base file for USDM ECUs without any issues)

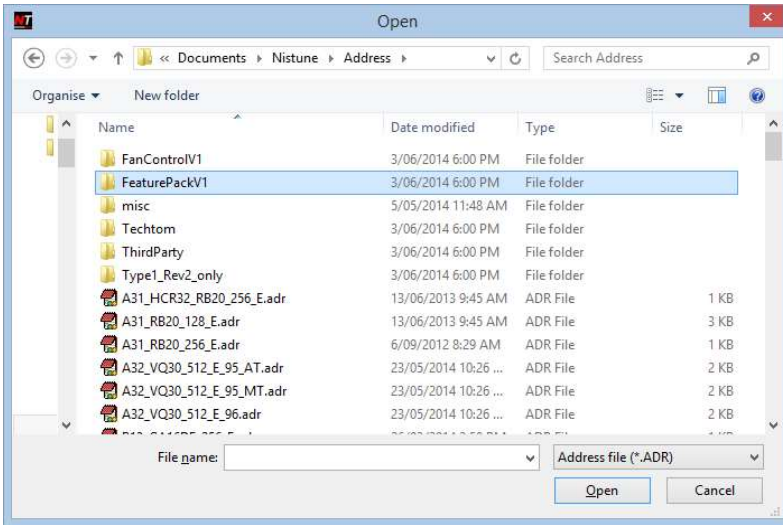
Hint: You can enter *FP* as the filename and press <ENTER> to filter the file names. Feature Pack 1 file names will end with 'xxxxF' whilst Feature Pack 2 files will end with 'xxxxG'

(c) Program the board as normal. Note: Lead to PIN4 is only needed for Rev1 Type 2 boards (2008-2009 era)

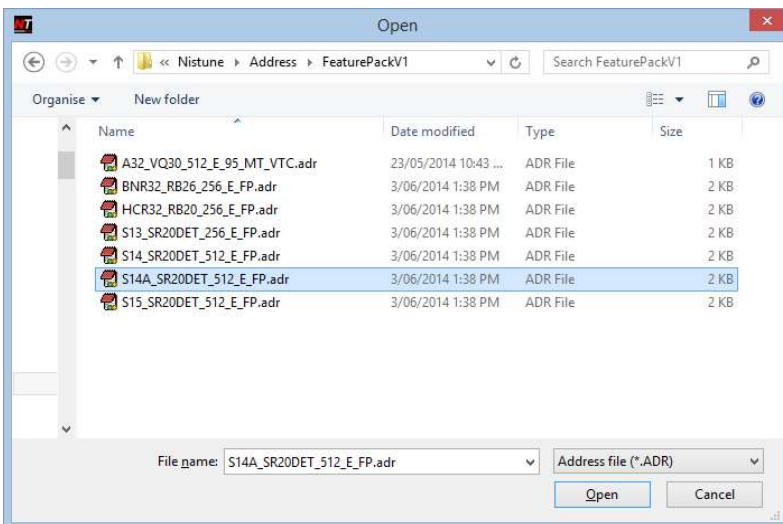


Getting Started

Special address files have been defined for vehicles supported. These are located in the Nistune address file folder as pictured. Open your required file through File > Select Vehicle and then Browse:



Folder containing feature pack address files:



Once the **Feature Pack 1** address file has been loaded, this will be indicated on the top title bar:

Nistune [S14A(SR20DET) Feature Pack 1.0 (Version: 1)]

Once the **Feature Pack 2** address file has been loaded, this will be indicated on the top title bar:

Nistune [WC34 STAGEA S2 (RB25DET) Feature Pack 2 (Version: 1)]

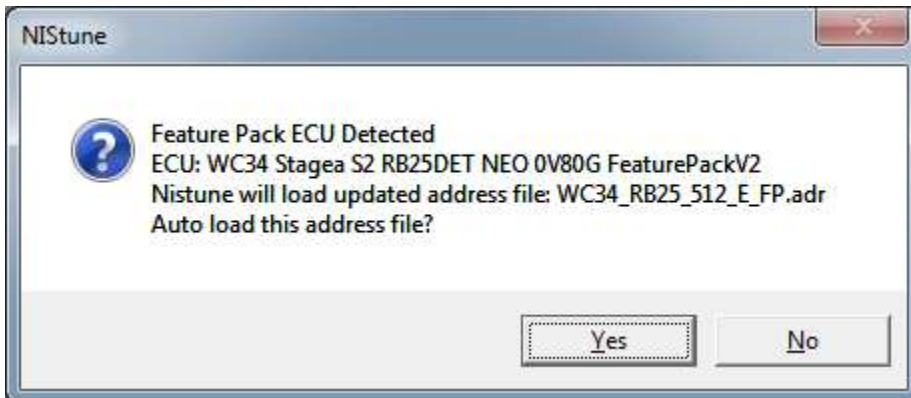
Connecting to Consult

When connected to your ECU the part number will display as ECU ID: 23710-XXXXF. The 'F' at the end of the ECU part number indicates that Feature Pack 1 firmware is loaded in your board.

For Feature Pack 2, it will show as part number: 23710-XXXXG. The 'G' at the end of the ECU part number indicates that Feature Pack 2 firmware is loaded in your board.

If the board does not have this part number then you will need to get it reprogrammed to use the updates documented here.

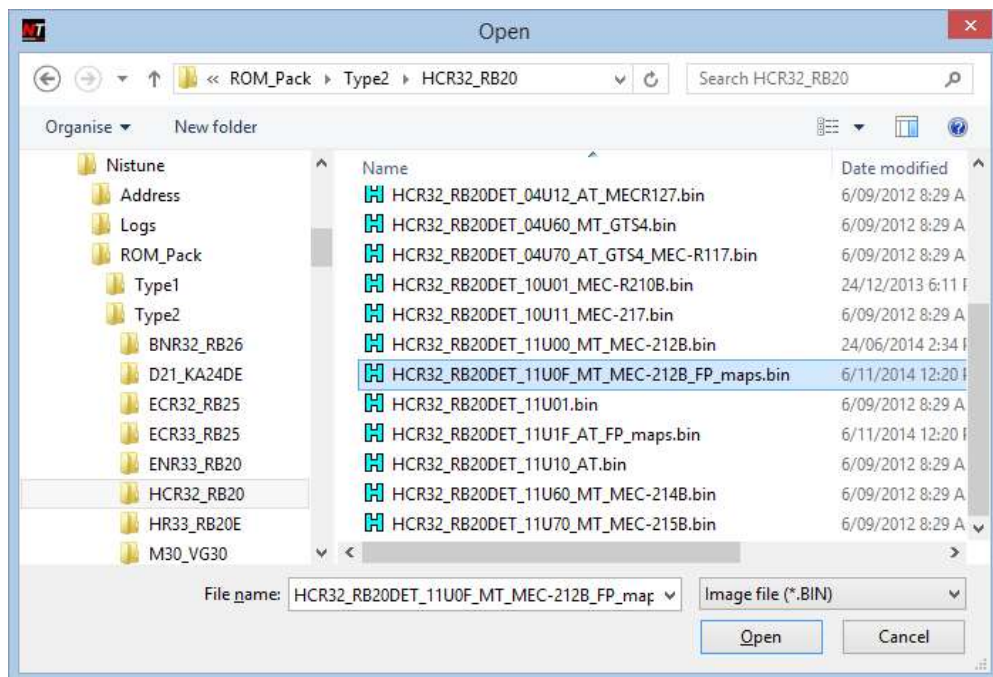
If you have the incorrect address file loaded, Nistune will detect this and prompt you to open the correct file



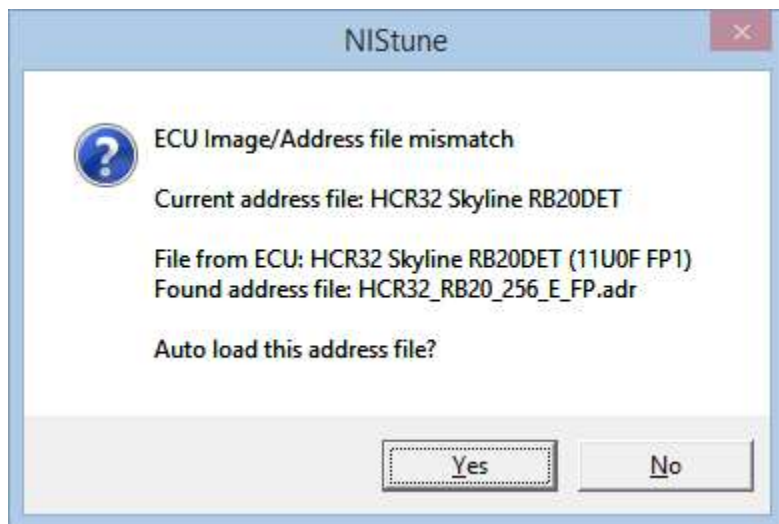
Using the 'download' button will retrieve the current Feature Pack maps from the ECU for you to start from

Loading Feature Pack base maps

Feature Pack base maps have a similar filename to the original Nissan files but will end with 'FP_maps'. Inside Nistune you can File > Open Main Image to use one of these maps to load into your board. The matching base image must end with 'FP_maps' as per below



If you have the incorrect address file loaded, Nistune will detect this and prompt you to open the correct file

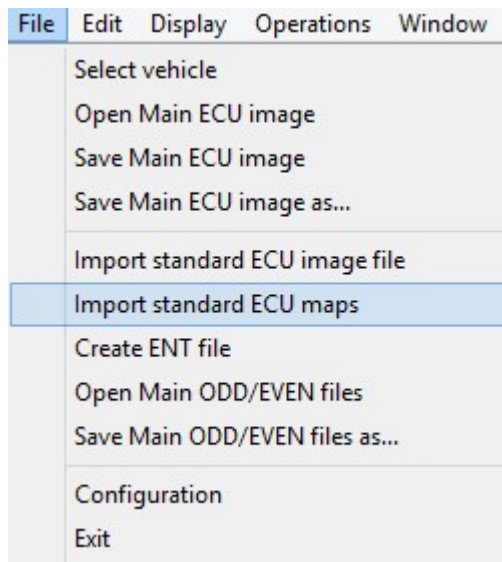


Importing Tunes

Due to the updates provided in the new Feature Pack, previous standard Nissan tunes loaded tuned inside Nistune will need to be imported.

Use the menu option File > Import Standard ECU maps

Warning: Do not load them into your Feature Pack board using the normal File > Open Image option



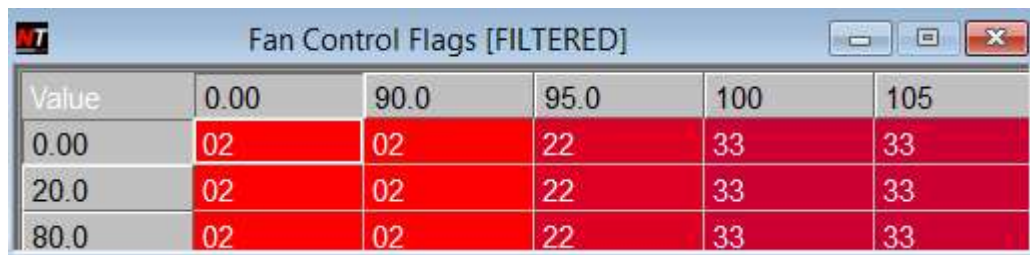
This option will copy all the standard maps supported by Nistune into the software. Any new maps or parameters such as those for flex fuel, launch control, VCT etc which are not in the standard Nissan file will not be in the tune file you are importing

It is important to import your maps over an existing Feature Pack tune (by either downloading the feature pack tune from your Nistune board, or opening the FP_maps base tune file for your vehicle).

Fan Control

Applies to : S14 SR20DET, S15 SR20DET

The main switching used for the fan control is based on the following table:



Value	0.00	90.0	95.0	100	105
0.00	02	02	22	33	33
20.0	02	02	22	33	33
80.0	02	02	22	33	33

Note: Right click the table to switch between RAW and FILTERED [HEX] view

This fan control is available to the user in both regular and FP versions of Nistune. HEX view displays what are known as Bit flags.

02	Fans off
22	Low fans on
33	High fans on

The table is indexed by speed (LHS column) and Coolant Temperature (degrees C across the top). You will note in the above table that the fan operation works the same irrespective of the vehicle speed. You can alter this if you wish, for example fans on around idle and off at higher speeds.

[-] Fan Control

Fan deactivate temp delay

Fan Temp Band 1 active

Fan Temp Band 2 active

Fan Temp Band 3 active

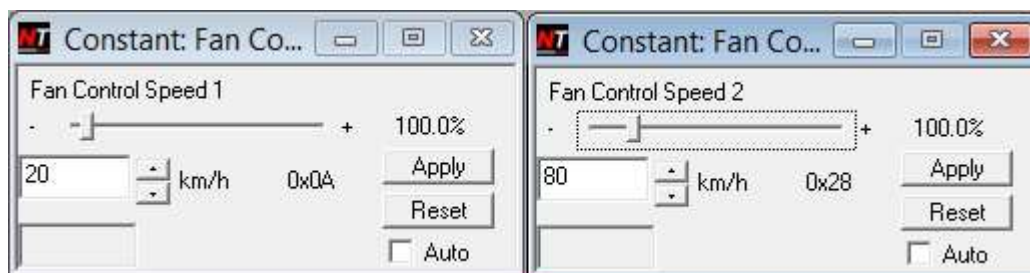
Fan Temp Band 4 active

Fan Control Speed Band 1

Fan Control Speed Band 2

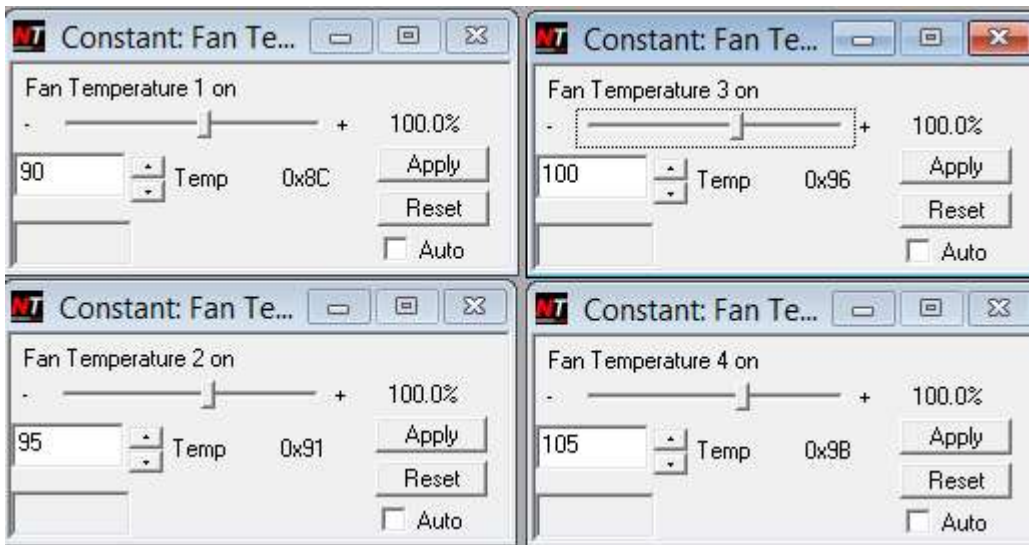
Speed Bands

You can change the activate speed for selecting when the bottom two rows are to be used using these parameters.



Temperature Bands

The first four temperature bands select the minimum temperature to enter the band in the table. If you adjust these values and then reopen the table, the temperature labels will update



Usage: Normally to decrease the temperature, drop the bands lower (say by 5 degrees)

Flex Fuel

Overview

Flex fuel sensors measure the ethanol content of fuel passing through it and report the rating as a percentage. The sensors output a frequency and a converter is required to translate this into a voltage which can be read by the ECU.

Installation

Refer to the Feature Pack Hardware Installation manual on our website (Under Support > Installation Documentation). You require either a Zeitronix ECA-2 converter, or Nistune flex converter harness. Zeitronix units can be used with their own gauge. A continental GM type sensor must be used with Nistune.

Flex Feature Selection

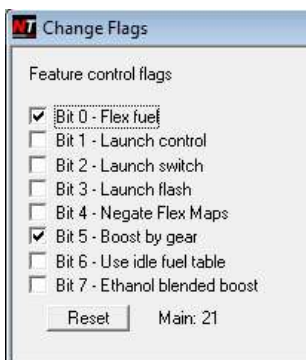
Enable the flex fuel settings via 'Feature Control Flags' parameter on the LHS parameter selection list

Feature Pack 1



Note: *Negate flex maps was available from feature pack 1 ROM files, from mid-2015 onwards.*

Feature Pack 2



Note: Enabling the flex fuel option inside Nistune will control the boost solenoid by the Ethanol percentage used by the vehicle. The referencing is done in the **Boost Flex Content** table.

Once this is enabled, several tables are available to you for tuning:

[-] Flex Fuel
Fuel Flex Map
Timing Flex Map
Enrich (Flex Ethanol content)
Crank Enrich (Flex Ethanol content)
Fuel Flex Content Table
Timing Flex Content Table

Flex Output Display

The ethanol content is available on the gauges inside Nistune. You can view these using the gauges inside the Nistune software.

Note: You must have **Flex Fuel** ticked for the ethanol display to work in the software

Note: Due to being extra parameters added to the ECU, these values are only refreshed less frequently than other gauges and are available only in 'Tuner mode'



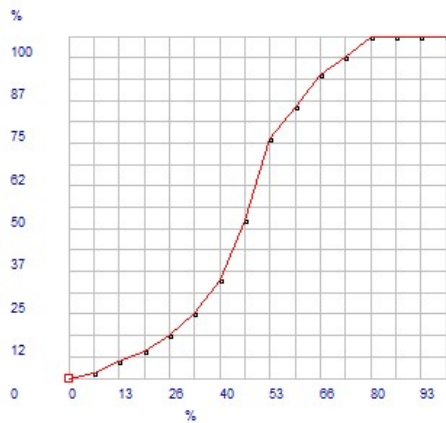
Ethanol scaling

Ethanol content is measured in terms of percent of ethanol measured by the flex fuel sensor. It is an index to two content scalers tables. These tables convert ethanol content (top row) to a percentage of adjustment for the ECU to use. There is a scaler table for fuel and a separate table for timing.

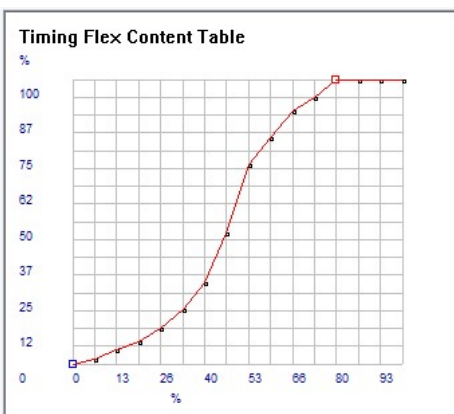
Note: The range of adjustment is 0 – 63 where 63 is maximum value the ECU will use. For example a value of 32 would apply half of the flex fuel or timing trims

%	0.00	6.67	13.3	20.0	26.7	33.3	40.0	46.7	53.3	60.0	66.7	73.3	80.0	86.7	93.3	100.0
%	0.00	1.59	4.76	7.93	12.7	19.0	28.6	46.0	69.8	79.3	88.9	93.6	100.0	100.0	100.0	100.0
Value	0	1	3	5	8	12	18	29	44	50	56	59	63	63	63	63

Fuel Flex Content Table

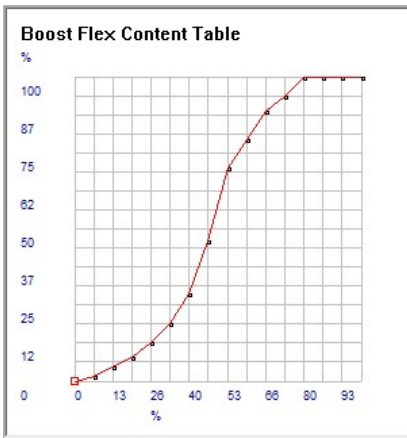


%	0.00	6.67	13.3	20.0	26.7	33.3	40.0	46.7	53.3	60.0	66.7	73.3	80.0	86.7	93.3	100.0
%	0.00	1.59	4.76	7.93	12.7	19.0	28.6	46.0	69.8	79.3	88.9	93.6	100.0	100.0	100.0	100.0
Value	0	1	3	5	8	12	18	29	44	50	56	59	63	63	63	63



Boost scaling is also available if the board is loaded with Feature Pack:

Boost Flex Content Table [RAW]																
%	0.00	6.67	13.3	20.0	26.7	33.3	40.0	46.7	53.3	60.0	66.7	73.3	80.0	86.7	93.3	100.0
%	0.00	1.59	4.76	7.93	12.7	19.0	26.6	46.0	69.8	79.3	88.9	93.6	100.0	100.0	100.0	100.0
Value	0	1	3	5	8	12	18	29	44	50	56	59	63	63	63	63



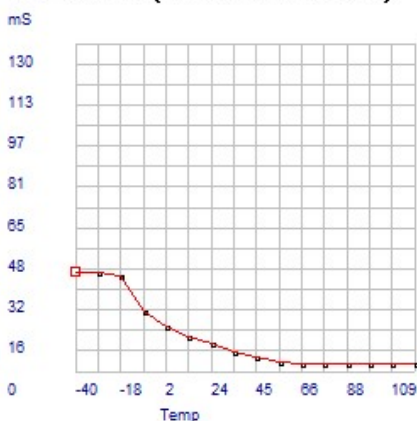
Ethanol adjustment – Crank Enrichment

During cranking, only the Crank Enrich table is used to inject a set amount of fuel based on the milliseconds in the table. Extra fuel can be added for ethanol fuels using the **Crank Enrich (Flex)** table. The table is scaled by the fuel content scaler.

This fuel is extra milliseconds **added** on top of the fuel in the standard crank enrich table (or **reduced** if **Negate Flex Maps** is ticked)

Crank Enrich (Flex Ethanol content) [RAW]																
Temp	-40	-30	-20	-10	0.00	10.0	20.0	30.0	40.0	50.0	60.0	70.0	80.0	90.0	100	110
mS	39.0	39.0	36.0	24.0	18.0	14.0	11.0	8.00	6.00	4.00	3.00	3.00	3.00	3.00	3.00	3.00
Value	39	39	38	24	18	14	11	8	6	4	3	3	3	3	3	3

Crank Enrich (Flex Ethanol content)

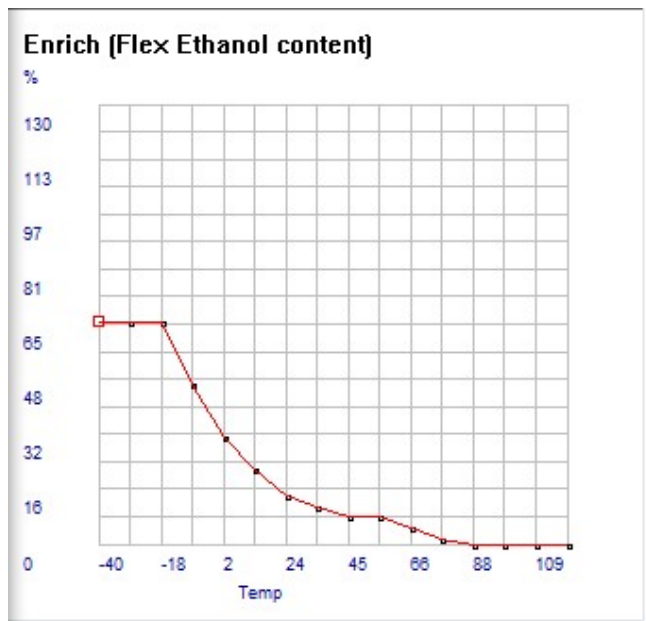


Extra fueling required during cold start for ethanol only can be adjusted in a second table located in the 'Enrichment section' of Nistune. This table is also scaled by ethanol content, so enrichment reduces as ethanol content decreases.

Ethanol adjustment – Temperature Enrichment

During cold starts, extra fuel is required when running Ethanol, in addition to what is added in the Flex fuel map. This table will **add an extra** percentage of fuel during warmup until 80degC table (or **reduced** if **Negate Flex Maps** is ticked)

Temp	-40	-30	-20	-10	0.00	10.0	20.0	30.0	40.0	50.0	60.0	70.0	80.0	90.0	100	110
%	65.6	65.6	65.6	48.9	31.3	21.9	14.1	10.9	7.81	7.81	4.69	1.56	0.00	0.00	0.00	0.00
Value	42	42	42	30	20	14	9	7	5	5	3	1	0	0	0	0



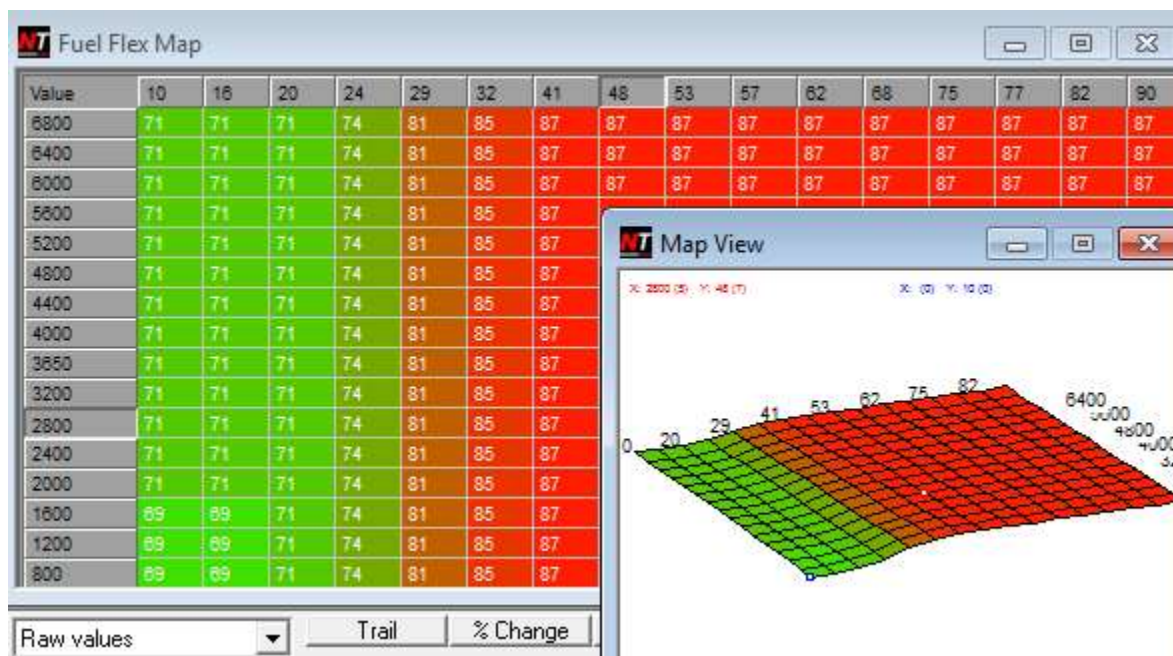
Ethanol adjustment – Fuel trimming

Fuelling is calculated as a trim value between 0 – 127. This **adds** an additional percentage of fuel to the current injection time (or **reduced** if **Negate Flex Maps** is ticked)

The trim will be multiplied by the flex content table, so as ethanol content drops, the final trim amount is reduced.

Values are adjusted to add the extra required amount of fuel on E85 compared to standard 98 octane fuel.

Adjustments are made against load and RPM axis.

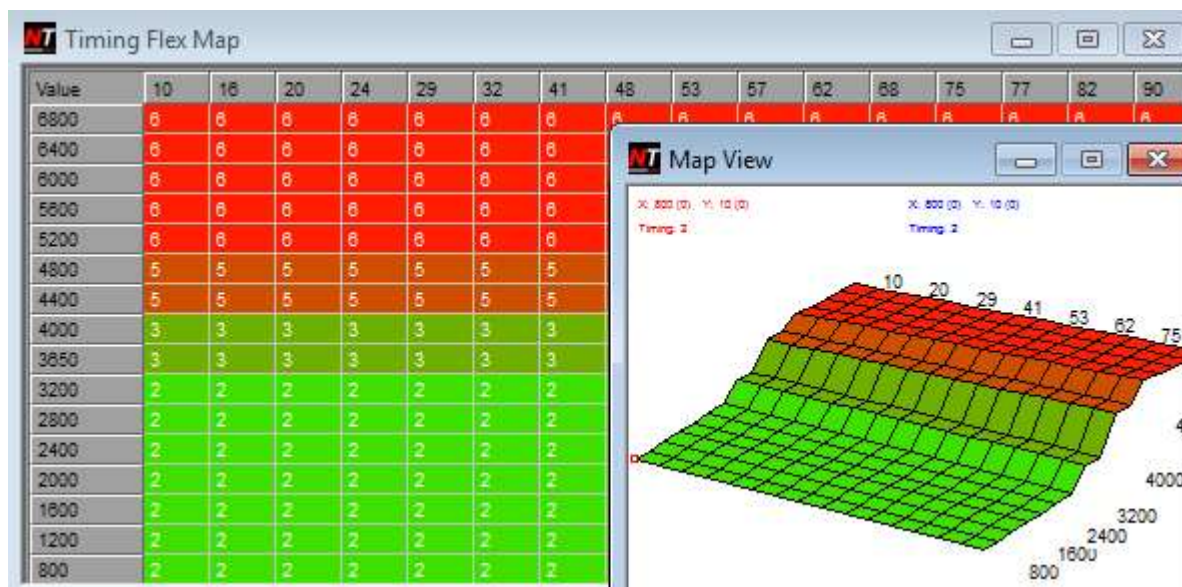


Ethanol adjustment – Ignition Timing trimming

Ignition timing flex trims work over the same load and RPM axis. This **adds** additional timing where required to the standard timing maps (or **reduced** if **Negate Flex Maps** is ticked)

The amount of timing will be multiplied by the flex timing content table.

For example with 10 deg BDTc extra timing but at 40% ethanol (or 50% scaled multiplier) Nistune would calculate an extra 5 degrees of timing

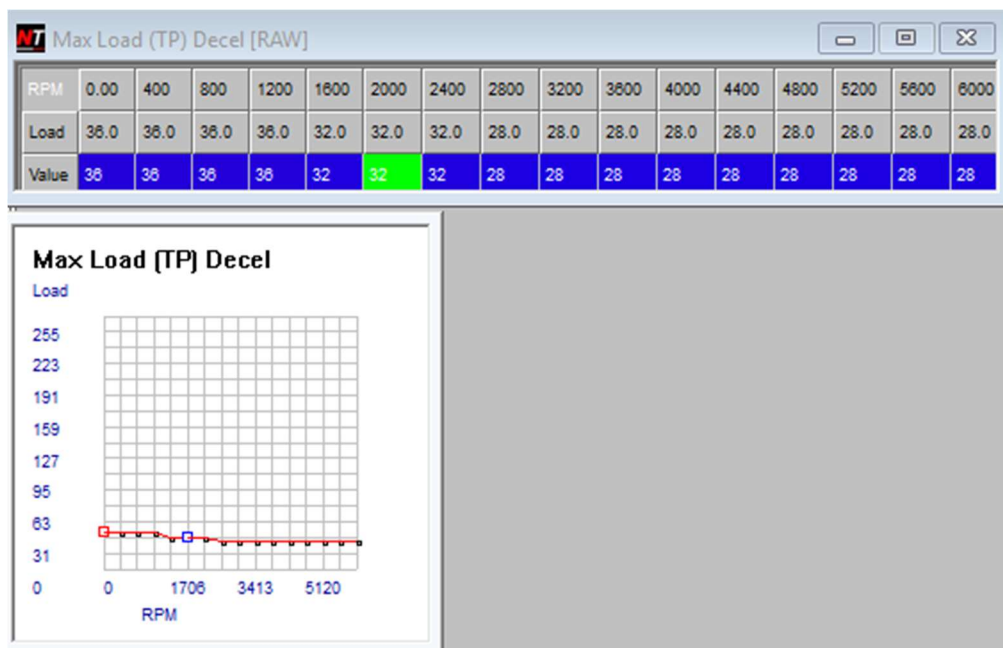


Load Limiting [Anti Stall] (FP1.1, FP2.1)

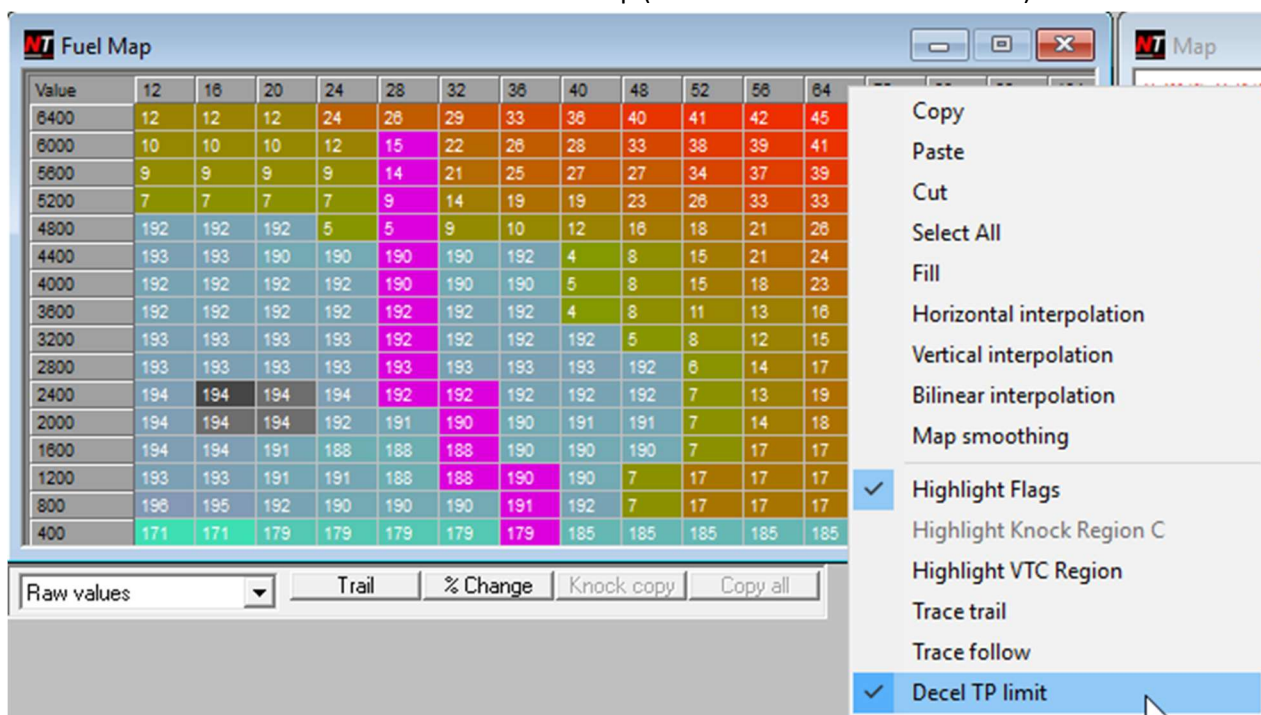
One of the issues with using MAF sensors, is that they can measure airflow in both directions, or during undesirable conditions (such as release of accelerator, but the turbocharger is still spinning and sucking through airflow)

Whilst this can be alleviated through using plumb back blow off valve and adding corner piping between the MAF and the turbocharger, another set of tables has been introduced.

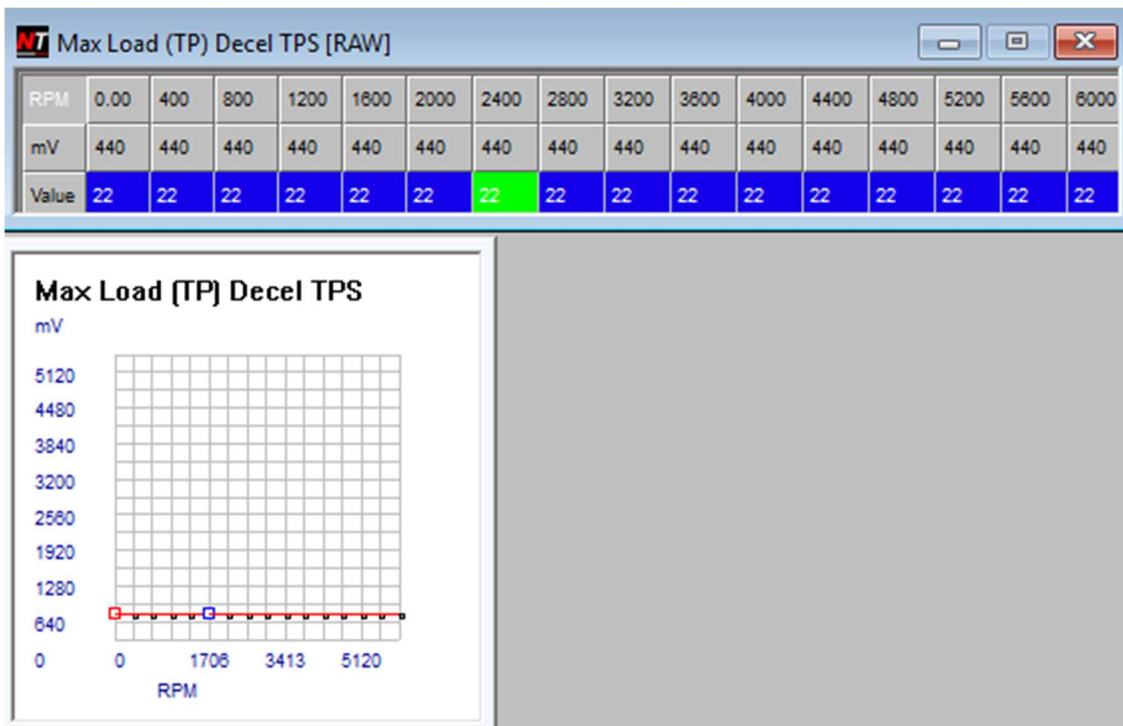
Limit the maximum load determined by the ECU, by using the below **Max Load (TP) Decel limit** table. This works differently to the Max Load (TP) table by only operating when TPS is below a certain voltage, and limiting TP referencing in the maps as well as total fuel calculations



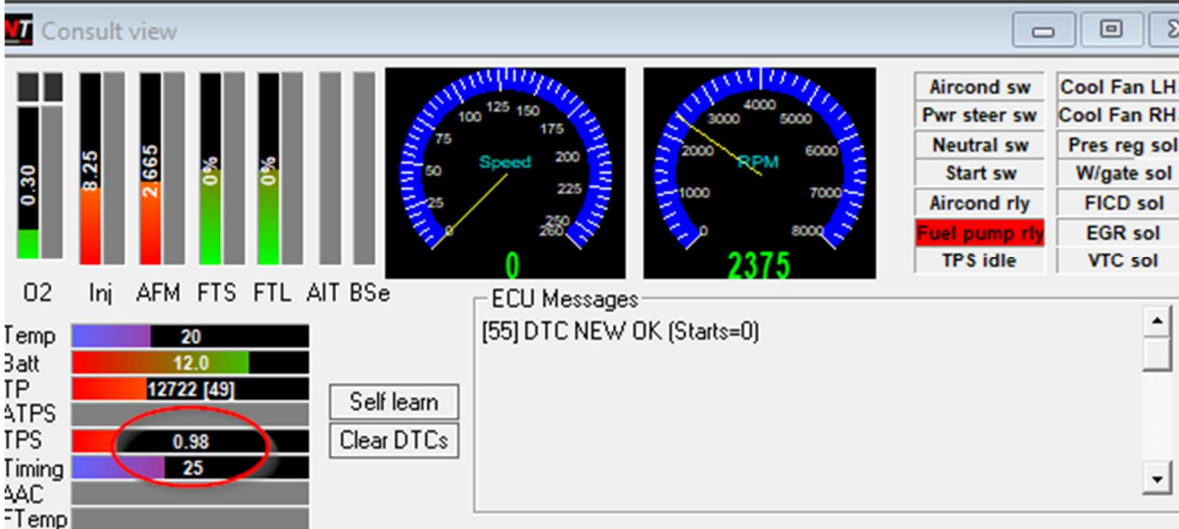
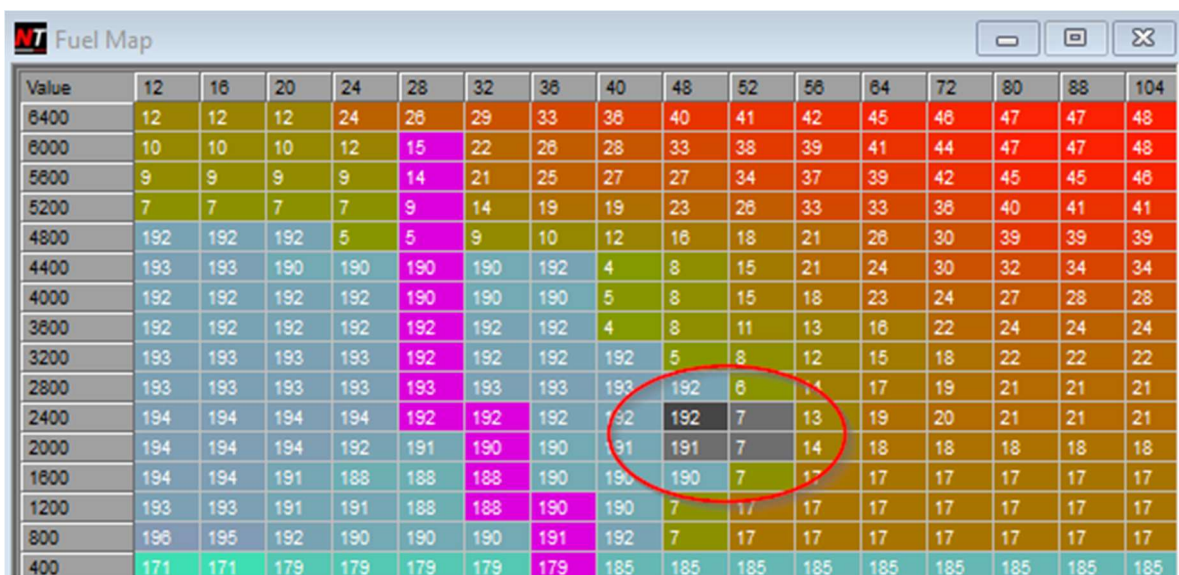
The above table limits can be viewed in the fuel map (when **Decel TP Limit** is enabled)



The adjustment for the TPS position depends on the following table. Default is 440mV (around idle) but can be adjusted to suit



As can be seen below, when the TPS is over the limit, then TP operates as normal



However on deceleration when TPS is near or below the value, then the cursor is limited to the TP limit line

Value	12	16	20	24	28	32	36	40	48	52	56	64	72	80	88	104
6400	12	12	12	24	26	29	33	36	40	41	42	45	46	47	47	48
6000	10	10	10	12	15	22	26	28	33	38	39	41	44	47	47	48
5600	9	9	9	9	14	21	25	27	27	34	37	39	42	45	45	46
5200	7	7	7	7	9	14	19	19	23	26	33	33	36	40	41	41
4800	192	192	192	5	5	9	10	12	16	18	21	26	30	39	39	39
4400	193	193	190	190	190	192	4	8	15	21	24	30	32	34	34	34
4000	192	192	192	192	190	190	5	8	15	18	23	24	27	28	28	28
3600	192	192	192	192	192	192	4	8	11	13	16	22	24	24	24	24
3200	193	193	193	193	192	192	192	192	5	8	12	15	18	22	22	22
2800	193	193	193	193	193	193	193	193	192	6	14	17	19	21	21	21
2400	194	194	194	194	192	192	192	192	192	7	13	19	20	21	21	21
2000	194	194	194	192	191	190	190	191	191	7	14	18	18	18	18	18
1800	194	194	191	188	188	188	190	190	190	7	17	17	17	17	17	17
1200	193	193	191	191	188	188	190	190	7	17	17	17	17	17	17	17
800	196	195	192	190	190	190	191	192	7	17	17	17	17	17	17	17
400	171	171	179	179	179	179	179	185	185	185	185	185	185	185	185	185

This helps avoid overfueling on deceleration

Low Voltage Crank Adjustment (FP1.1, FP2.1)

The Crank Voltage Adjustment table is used in conjunction with the Crank Enrich table. It is a multiplier based on battery voltage. Setting to 100% (value = 63) will double the factory injection time

Below table at 20 degrees C coolant temp shows 9ms crank time. With 100% this would be doubled (18ms) so for low voltages, aim for a few extra ms as battery voltage drops:

Temp	-40	-30	-20	-10	0.00	10.0	20.0	30.0	40.0	50.0	60.0	70.0	80.0	90.0	100	110
mS	78.0	78.0	65.0	37.0	25.0	18.0	9.00	5.00	5.00	5.00	5.00	4.00	4.00	4.00	4.00	4.00
Value	78	78	65	37	25	18	9	5	5	5	5	4	4	4	4	4

Volts	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	78.2	50.8	25.4	0.00	0.00	0.00	0.00
Value	63	63	63	63	63	63	63	63	63	48	32	16	0	0	0	0

Crank Enrich
mS vs Temp

Crank voltage adjustment
% vs Volts

Injection time (LHS) [ms]
14.00

Boost Control (FP2)

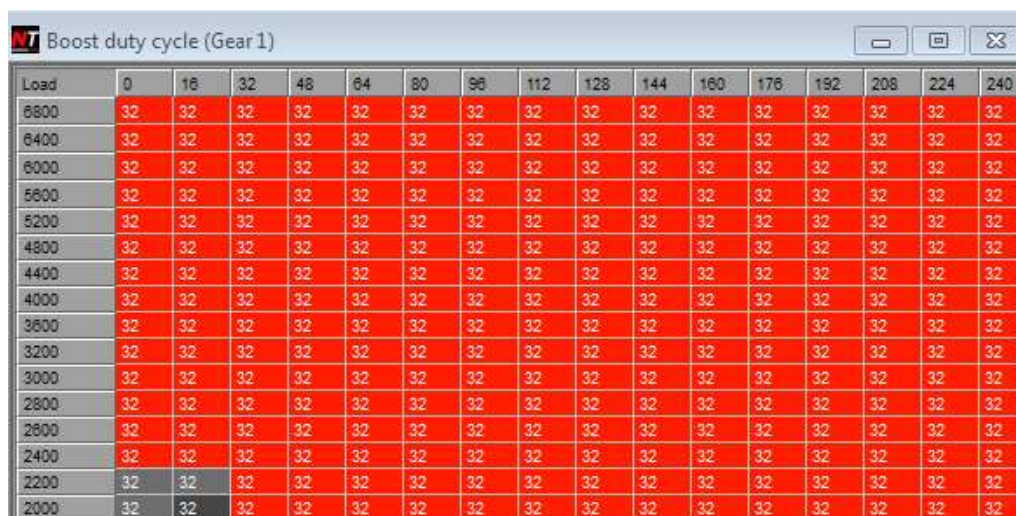
Overview

Feature Pack 2 is special order firmware which provides boost control for ECUs, which previously did not offer this feature, and a simpler boost control for those which previously used Nissans default boost control.

Operation

By default the Wastegate Solenoid output will be controlled by reading the boost duty cycle map. This is then used to control the boost solenoid (MAC valve or otherwise)

Tables are indexed by RPM and TPS input. The trace on the map will show the referenced location



Load	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
6800	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
6400	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
6000	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
5600	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
5200	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
4800	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
4400	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
4000	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
3600	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
3200	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
3000	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
2800	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
2600	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
2400	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
2200	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
2000	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32

The numbers in the table are between 0% - 99% of boost duty which is indicated by the wastegate solenoid parameter. This can be viewed in the software gauges.



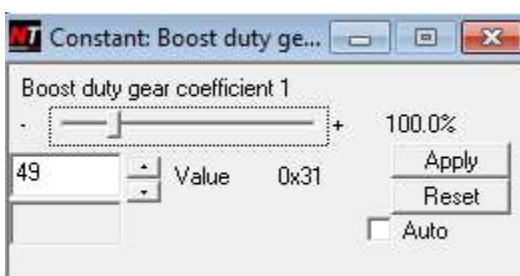
Boost by gear can be achieved by selecting from Feature Control Flags the 'Boost by gear' tickbox and utilising a second higher gear boost map inside the ECU. Note: This second map is disabled by default



Load	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
6800	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
6400	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
6000	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
5800	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
5200	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
4800	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
4400	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
4000	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
3800	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
3200	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
3000	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
2800	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
2800	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
2400	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
2200	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
2000	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16



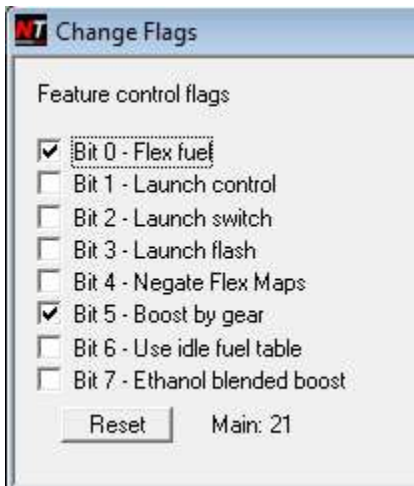
The second boost table usage is determined by the speed/RPM ratio in the Boost duty gear Coefficient:



Decreasing the coefficient will make the ECU use the higher gear map at a lower RPM.

Flex Feature Selection

Enabling the flex fuel option inside Nistune will control the boost solenoid by the Ethanol percentage used by the vehicle. The referencing is done in the Boost Flex Content table.



Boost flex content table is indexed by ethanol content (0-100%), similar to the Timing and Fuel content scaling tables in the software (Feature Pack V1)

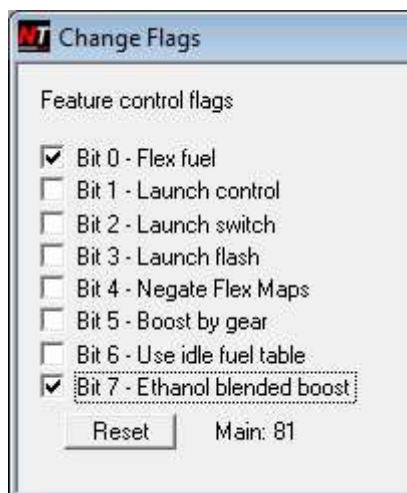


Example: With 66% ethanol in the tank, from the Boost Content lookup table referencing (56/63) or 88% of the duty cycle table

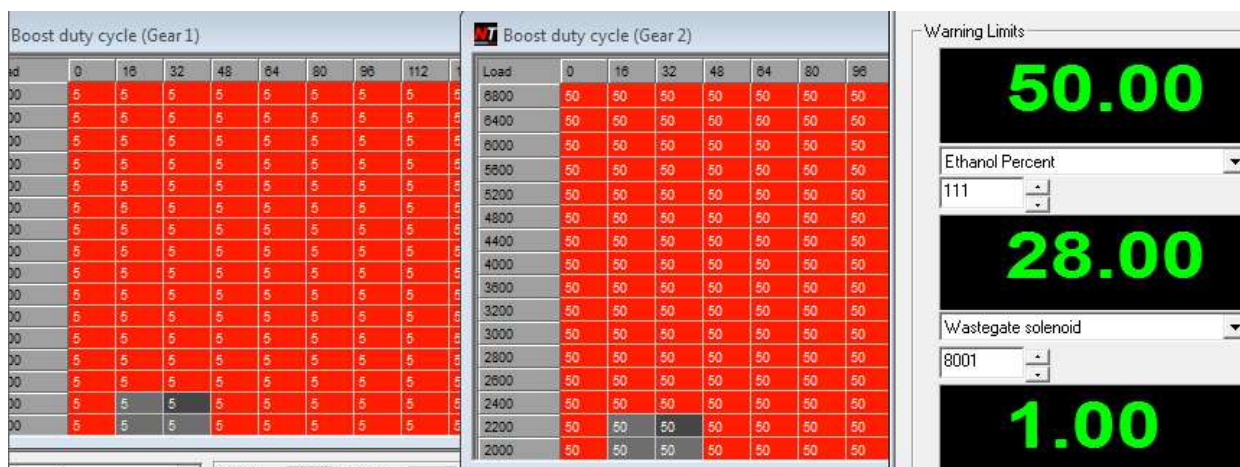
With the duty cycle table at 32% x 88% = 29% actual duty cycle at the MAC valve. This is shown in the Nistune software under 'Wastegate solenoid' gauge. Make sure you select this when connecting to the ECU.

Blended boost control feature

This feature is only available with Nistune FP2 ROM pack version 2.5 (and upwards)



When enabling 'Ethanol blended boost' the ECU will read the from both Boost duty cycle (gear 1) and Boost duty cycle (gear 2) and blend the values, dependent on current ethanol content:



In the above example of 50% ethanol content, there will be 50% x 5% duty + 50% x 50% duty = 28% duty cycle.

As ethanol content increases, the larger boost duty numbers in boost table 2 will be used, allowing for a smooth transition in boost as ethanol content changes.

Note: Boost by gear will be disabled, when Ethanol blending is used

Launch Control

Overview

Launch control has been added to Nistune. In the current version it utilises Nissans fuel cut facility by adjusting the RPM limits until the desired trigger has been reached. It is enabled from the **Feature Control flags** window



Enable the **Launch control** tick box in the Feature Control Flags panel. This will provide the ability to use the following Launch Control (LC) parameters in the ECU.

Also enable the **Launch flash** option and check your CEL (Check engine light) or for earlier ECU (eg S13 CA18/Z31/R31/VL Turbo) the LEDs at the side of your ECU flash quickly when enabled.



Note: When setting up launch control for the first time, start with the speed triggering option to gain familiarity with the settings, and keep Launch flash enabled.

Once you are happy with the desired function with speed trigger settings, then if you wish to use **Launch Switch** settings, then firstly read the Feature Pack Hardware Installation manual on connecting the switch to your ECU and then test your Power Steering or other documented input (S13 CA18DET/Z31/R31/VL Turbo)

Launch Control Parameters

The trigger and setting parameters for launch control are shown below:

[-] Customised
LC Launch speed
LC Rev Limit Retard
LC Rev Limit Cut
LC Ign Retard

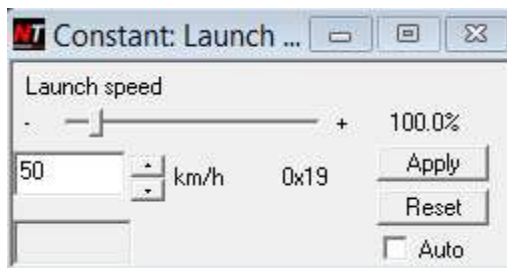
Triggering

There are two forms of triggering launch control

1. Speed triggering

Launch control is automatically activated from zero speed, and the limiters remain in place until the launch speed is reached. Adjust the speed to increase/decrease the point at which the engine can rev freely

Note: Check at zero speed (0 km/h) that the launch indicator flashes rapidly



2. External switch triggering

This can be used independently or with the speed triggering.

The existing power steering input line to the ECU will be used for the launch control triggering.

To disable speed triggering, increase the launch speed to maximum value.

Note: Check at low RPM (< 1200rpm) and no speed, that when the switch is pressed, the launch indicator flashes rapidly. Over this RPM, when the switch is pressed, launch control will be disabled.

Feature Pack V1.1 and V2.1 Update

The switch on / off feature from V1 and V2 has been removed, to launch when pressed.

Launch control operates now, only when the external input line is activated (ie. temporary button press)

Trigger Operation

When launch control is triggered, the check engine light will continuously flash quickly until the termination condition is met. This can be disabled by unticking 'launch flash' in the feature control flag settings.

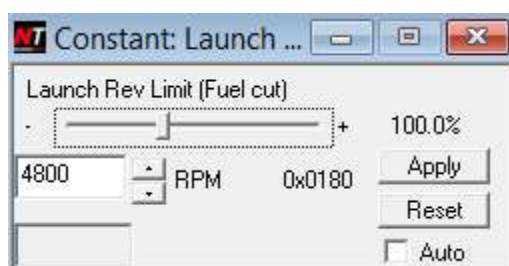
FP Version 1 + 2: Trigger switch operation will activate launch control when vehicle speed is at 0, engine speed is under 1200rpm and the switch has been pressed. Once activated, once the switch is pressed again over 1500rpm the launch control will be deactivated and the check engine light will cease to flash.

FP Version 1.1 + 2.1: Trigger switch will run launch control until released, or until top speed trigger is reached

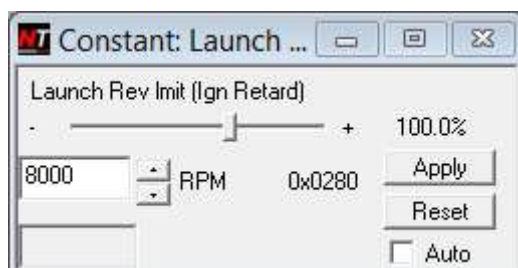
If you wish to use trigger speed in addition, you can set this at a desired speed to deactivated launch control once the speed has been met.

Note: Trigger switch will allow the user to operate launch control in vehicles without a speed sensor connected

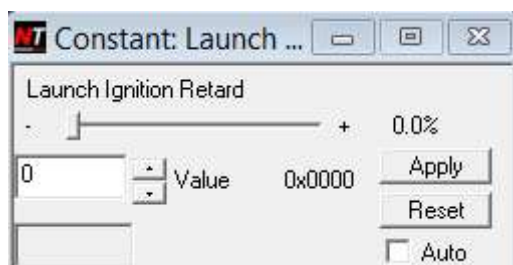
Launch Control Parameters



The launch rev limit will cut fuel at the specified engine speed. The cut performed will replace the vehicles soft RPM cut limit until launch control is deactivated. This should only activate when the indicator is flashing (launch enabled)



The launch ignition retard rev limit will retard ignition timing at the specified engine speed. By default this item is deactivated (being set at 8000rpm maximum RPM). Once RPMs exceed this value, timing is set to the value in the ignition retard box:



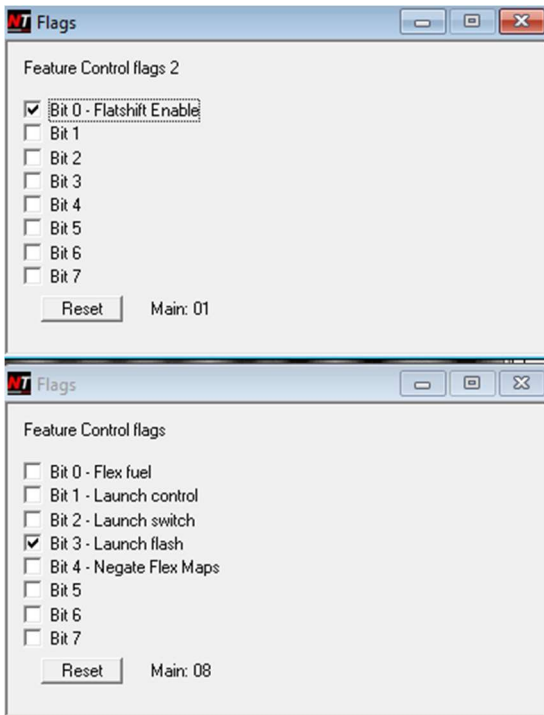
Which means that the current timing will be what you set in this field.

WARNING: Using low ignition timing can cause high exhaust gas temperatures . Be very careful when using low levels of ignition retard. At this time it is not possible for the Nissan ECU to do negative timing (after TDC)

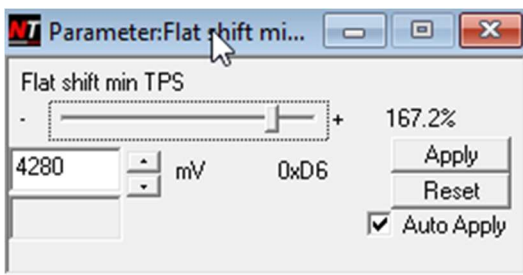
Flat Shifting (FP1.1 / FP2.1)

Overview

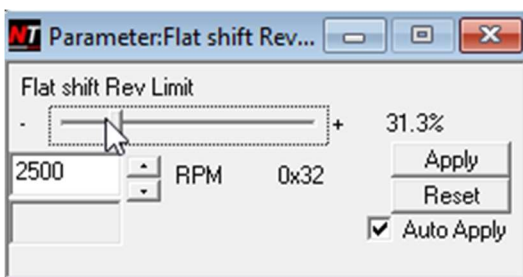
Feature pack 1.1 and 2.1 adds in flat shift capabilities. Enable flat shift in the Feature Control flags 2 tickbox, and use Launch Flash to enable the check engine light when it is active



Set the Flat Shift Min TPS parameter to the voltage level where you want Flat Shift to activate



Set the Flat Shift RPM limit to where you want the ECU to cut fuel



Once the clutch switch is enabled, and the TPS is over the minimum parameter, the check engine light will flash quickly, and the flat shift limiter will be engaged.

Total Injection Multiplier

Summary

Currently all Nissan tuning has involved the modification of the ECU Load Multiplier (K constant) parameter. This is a load calculation used for indexing all tables, as well as used as part of the final injection calculations.

From our workshop training slides we can see this is used to change the total injection time:

Theoretical Pulswidth



X

Short Term Trim (Closed loop)

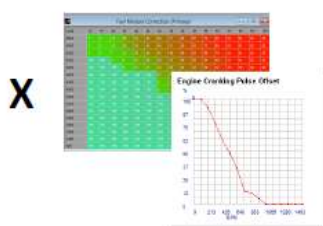


X

Long Term Trim (Stored)

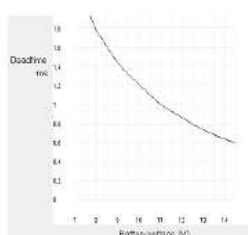


Total fuel calculations

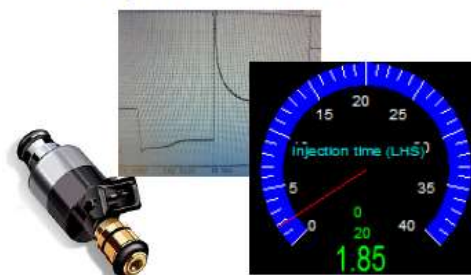


X

+ Injector latency



= Injector Pulswidth



TP Scaling Impacts

However it has an impact to any tables which rely on TP for indexing load scales in the tables used in the ECU. Changing load scales in some (but not all of the maps) in the ECU can be problematic where large changes in Load Multiplier have been made.

Nistune feature packs now offer an extra fuel adjustment multiplier "Total Injection Multiplier". With this parameter now available, there is no need to alter K constant for injector resizing

TP Load Tables

1. Avoid changing your load scales on fuel and timing maps
2. When resizing MAF, the measured load of the vehicle will change. Still allow standard adjustments to K constant to reflect the change in load. Your load tracing cursor in the software should still function across the standard fuel and timing load scales
3. When resizing injectors or trimming fuel adjustments, use the "Total Injection Multiplier" to make changes to total fueling adjustments in the vehicle

Built in rescaling using Total Injection Multiplier

When Feature Pack, is used the adjustments will be made to the Total Injection Multiplier parameter.

Injector CC => Injection multiplier

Current	<input type="text" value="370"/>	Value: 512	(0x0200)
New	<input type="text" value="550"/>	Value: 344	(0x0158)

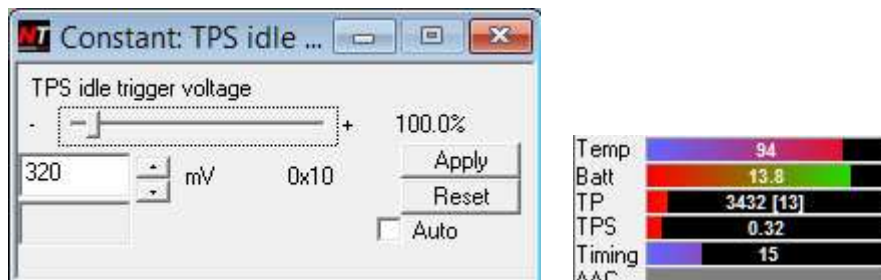
Adjust TP (load) scalars

Adjust TP Max limit

Adjust Cranking Tables

Throttle Position Sensor Idle Trigger

(RB25DET using RB20DET ECU)



When using the RB20DET ECU with an RB25DET engine (and TPS), you will note that there is only a Throttle Position Sensor (variable voltage) but no Throttle Idle switch

We have added to the RB20DET ECU code a Throttle Idle voltage setting to set idle position.

1. Monitor the TPS voltage when idle and set this value as the trigger (note 0.32mV above)
2. When pressing the throttle the 'TPS idle' switch indicator **TPS idle** on the consult view panel should turn off when this parameter is set correctly
3. TPS idle switch is used to determine when to use idle or normal timing maps

Variable Cam Timing Output

(RB25DET using RB20DET ECU)

There are two flavours of firmware depending on ECU and if air conditioning is required

(a) Remove RB25 Air conditioning output

A31: HCR32_FOR_RB25_11U00_74L00_MT_FP_TPS_VCT_ACOUT_v5.ent

R32: HCR32_FOR_RB25_11U00_MT_FP_TPS_VCT_ACOUT_v5.ent

(b) Utilise spare GREEN diagnostic LED (Available A31 and early R32 ECUs only)

A31: HCR32_FOR_RB25_11U00_74L00_MT_FP_TPS_VCT_LEDOUT_v5.ent

R32: HCR32_FOR_RB25_11U00_MT_FP_TPS_VCT_LEDOUT_v5.ent

Adjustments

Refer to the Nistune mapping guide for adjustments

Injection Latency Table (FP2)

Default Nissan injection control is done using a calculation which takes injection time at 14V and then applies a voltage/multiplier offset. This strategy has been changed with Feature Pack 2 firmware.

With the larger injector sizes offered by companies like Bosch (Injector Dynamics) and sometimes to resolve issues with other injector brands, the custom adjustment of latency is required at various voltage levels.

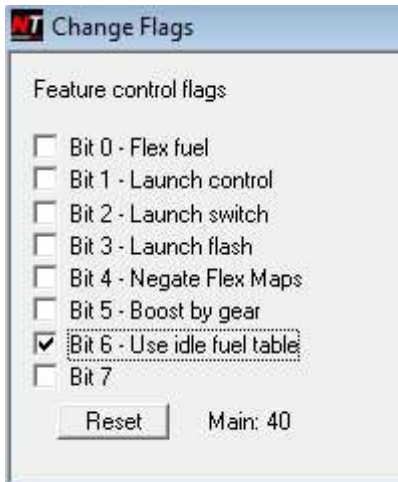
Nistune now offers a ms vs voltage adjustment for the latency table. This replaces previous injector latency (injector dead time) parameters in the software:



The raw value is adjusted to make the correct ms value as per the injector specifications.

Idle Fuel Adjustment (FP2)

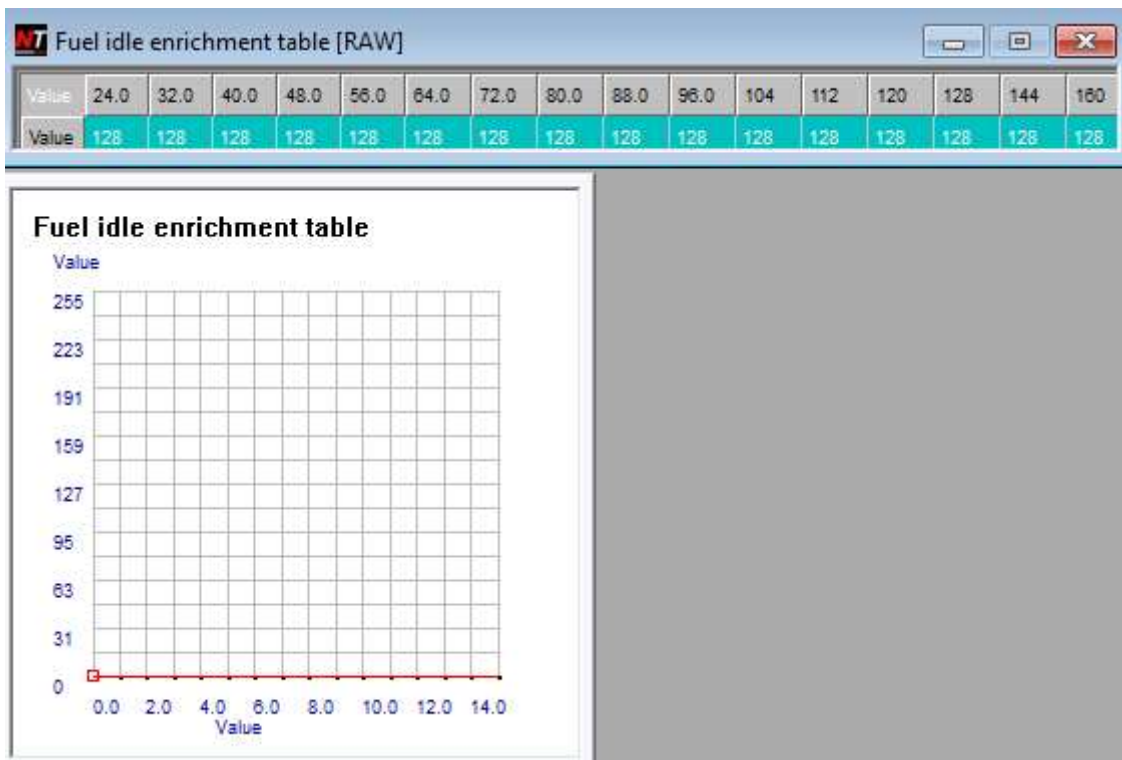
Nissan ECUs only reference the main fuel map. This does not allow individual control of fueling when at idle. An additional map and tickbox to enable this has now been added to Feature Pack 2.



Select the 'idle fuel table' to use this table when 'TPS idle' indicates the vehicle is at idle.

Value	24.0	32.0	40.0	48.0	56.0	64.0	72.0	80.0	88.0	96.0	104	112	120	128	144	160
Value	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

The indexing of the load values are still TP referenced as with the fuel map. The values in the table are displayed on the graph as 'filtered values'



Most ECUs have an O2 sensor offset of +128 or +192 used for the O2 closed loop (raw values). It can be filtered out by right click menu, then 'Filtered' tickbox

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