

FEATURE PACK VI



FEATURE PACK V2



Hardware Installation Manual

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Overview

This is the first edition of the Nistune feature pack. The feature pack offers enhanced features over the standard ECU for a selected range of vehicles.

The standard 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.

This document covers the ECU modifications required to use Flex fuel and Launch Control features

Flex Fuel

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.

Nistune will read the flex fuel input via diagnostic connector input on the ECU. This requires modification of the Nissan ECU hardware. A flex fuel kit comprising a sensor and content analyser is required.

Nistune Flex Converter

Nistune have developed a content analyser board which is internally mounted to the ECU. It will be sold with the board and flex cable. Flex fuel sensors can be purchased separately.



The flex board is mounted to the top of existing components using durable double sided table.

BLACK - GND RED – 12V GREEN – Input (0-5V)

Run a 5 volt line from the regulator to the 5V input

Zeitronix ECA 2

Zeitronix sell a content analyser in various packages, including with and without a display. http://www.zeitronix.com/Products/ECA/ECA.shtml



The ECA-2 module includes wiring information. For wiring to your ECU **Red** is wired to the ECUs switched 12V power line and **Black** is wired to the Ground line. The other wire to connect is the white/blue striped 0-5V signal wire, this connects to flex input (diagnostic input) same as GREEN with the Nistune flex converter.

BLACK - GND RED – 12V WHITE/BLUE – Input (0-5V)

Sensor Installation

WARNING: Competent professionals must install the flex fuel sensor according to the manufacturer's instructions. The flex fuel sensors are normally installed on the return line to the fuel tank. Flex sensor: Continental #13577394



Image: Flex fuel sensor connected to fuel return line on S14 200SX

Note: Special modifications are required for the ECA-2 module to some ECUs to correct pull up voltage (5.12 volts). See below:

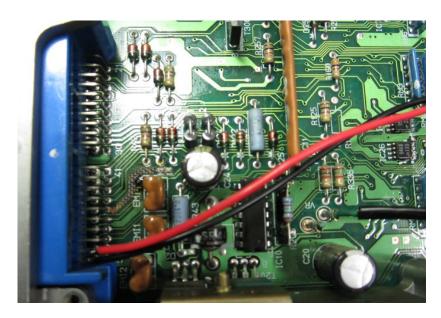
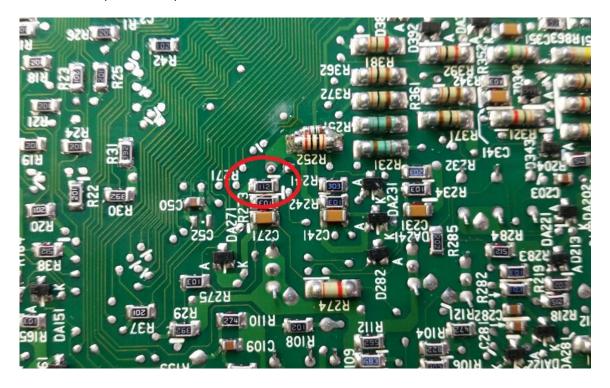


Image: HCR32 ECU with two end pins connected to flex converter power

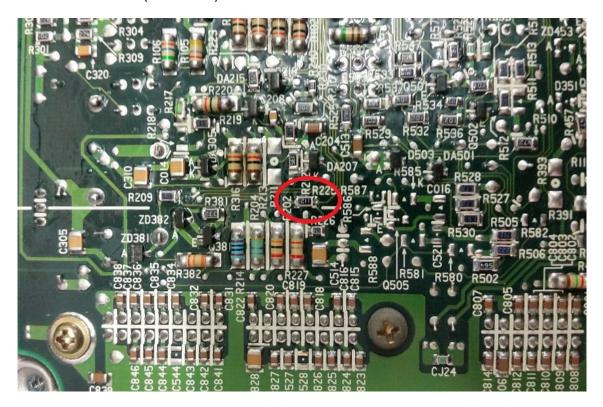
Z32 VG30DETT (Type 2)

Remove R241 (marked 112)

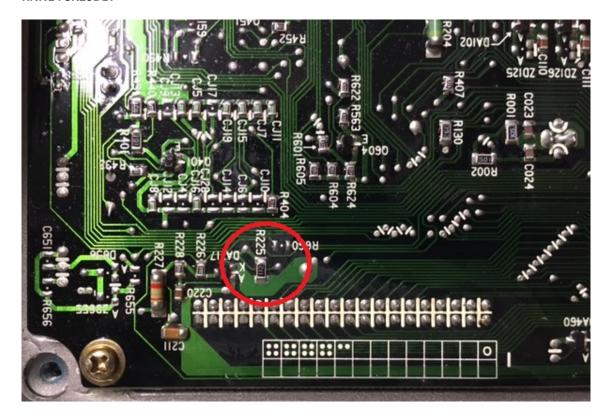


S13 SR20DET

Remove resistor R225 (marked 112)

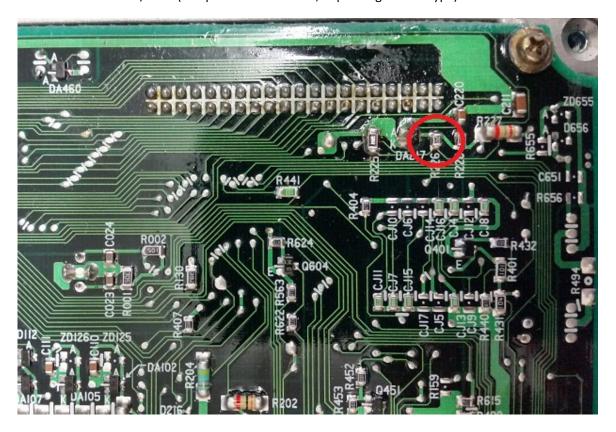


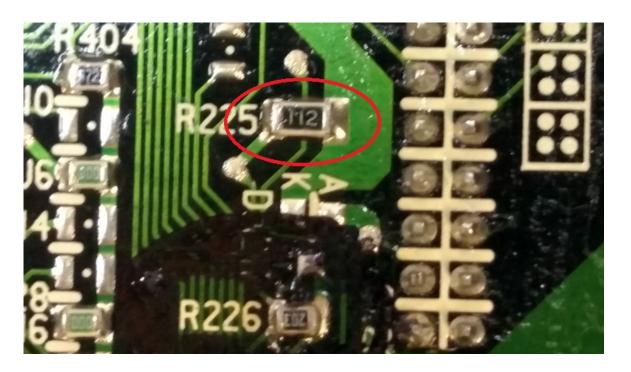
RNN14 SR20DET



B13 SR20DE / S13 SR20DE / P10 SR20DE / N14 SR20DE / S13 KA24DE

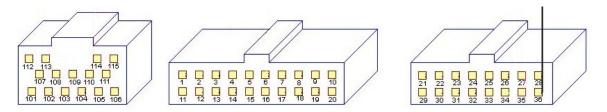
Remove resistor R225/R226 (component marked 112, depending on ECU type)





Nissan ECU Connectors

Z31 VG30 / R31 RB30 / VL RB30



Pin 27 is power, Pin 28 is ground

S13 CA18DET, S14 SR20DET, HCR32 RB20DET, BNR32 RB26DETT, Z32 VG30DET etc

Pin 49 is Power and pin 50 is Ground

10	1	102	10	13	104	1	85 1	06	18	10	38	1	2	3	T	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	38	41	42	43	44	45	46	47	48	49	50
10	9	110	11	11	112	1	13 1	14	11:	11	8	11	12	13	1	14	15	16	17	18	19	20	31	32	33	34	35	36	37	38	39	40	51	52	53	54	55	56	57	58	59	60

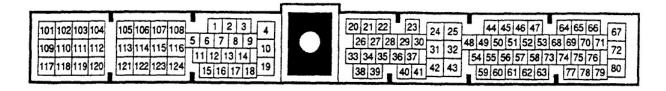
S13/S14A/S15 SR20DET, P11 SR20DE, B13 SR20DE, S13 KA24DE etc

Pin 38 is Power and pin 39 is Ground



ER34/WC34 RB25DET

Pin 67 is Power and Pin 25 is ground



Diagnostic Potentiometer Removal

Earlier Nissan ECUs are fitted with a diagnostic potentiometer. This will require removal in order to fit the flex fuel sensor line to the ECU.

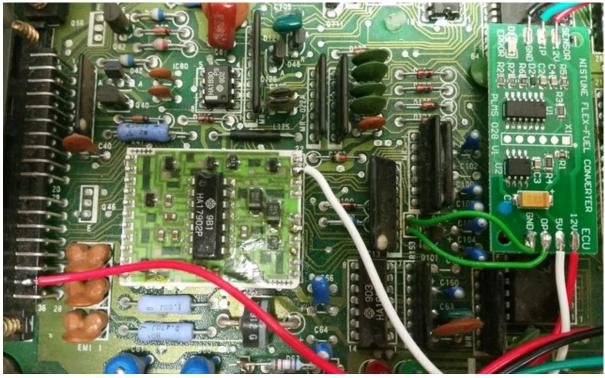
Remove the diagnostic connector by unscrewing (or desoldering if surface mounted) and then fit the flex fuel sensor line in place to the diagnostic input.



Image: HCR32 ECU diagnostic potentiometer

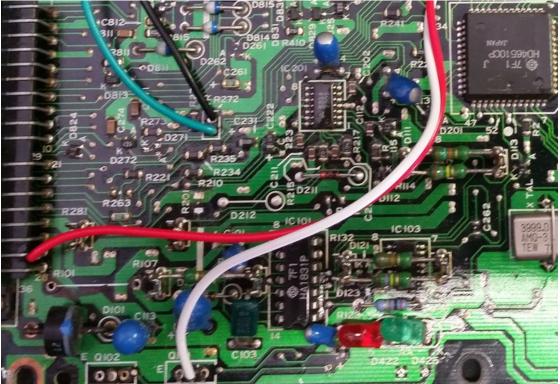
1. Z31 300ZX VG30 / VL RB30 / R31 RB30 ECU





- Cut both lines to the diagnostic connector
- Connect top line (GND) to Ground input on flex fuel converter
- Connect bottom line (Diag input) to OP on flex fuel converter
- Source 5V supply from OPAMP board Pin 21
- Source 12V supply from ECU power line on ECU connector pin 27

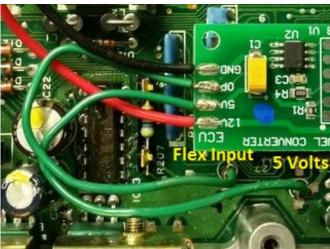




- Cut both lines to the diagnostic connector
- Connect top line (GND) to Ground input on flex fuel converter
- Connect bottom line (Diag input) to OP on flex fuel converter
- Source 5V supply from regulator (middle pin)
- Source 12V supply from ECU power line on ECU connector pin 27

2. S13 CA18DET ECU

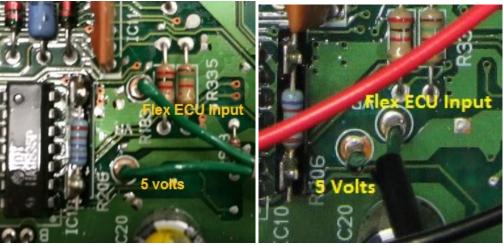




- Cut both diagnostic wires and connect LHS line to flex fuel sensor output line.
- For the Nistune Flex Converter, power the unit using the RHS line which provides 5 volts

3. HCR32 RB20DET ECU





- Cut both diagnostic wires and connect RHS line to flex fuel sensor output line.
- For the Nistune Flex converter, power the unit using the 5 volt output from the ECU as marked

4. BNR32 RB26DETT ECU

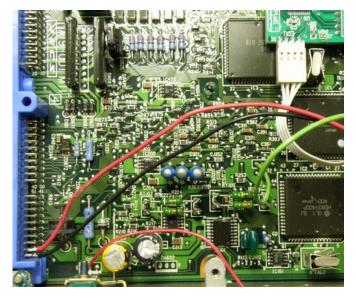


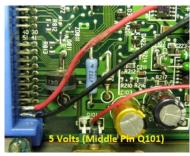


- Cut both diagnostic wires and connect RHS line to flex fuel sensor output line.
- For the Nistune Flex converter, power the unit using the 5 volt output from the ECU as marked



5. Z32 300ZX VG30DE/DETT ECU





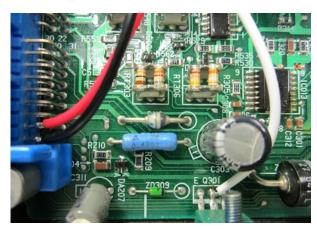


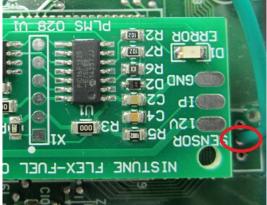
Cut both diagnostic wires and connect LHS line to flex fuel sensor output line.
 For the Nistune Flex converter, power the unit using the 5 volt output from the Q101 middle pin as marked

6. S13 SR20DE/SR20DET ECU



- Remove VR229 (variable resistor)





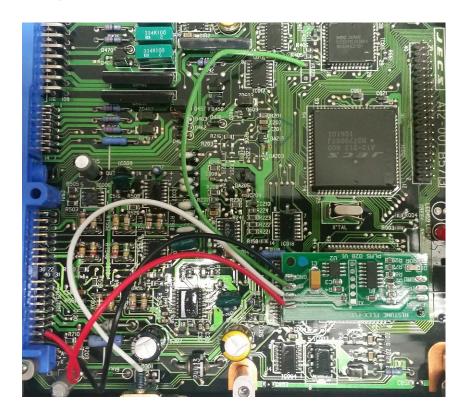
- Solder flex fuel input line as pictured to lower solder pad
- For the Nistune flex converter, power the unit using the 5 volt output from the middle pin as marked



Remove VR229 diagnostic port and lower ground wire. Reuse top variable input wire to flex board

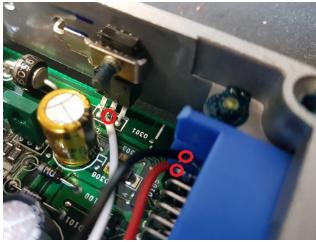


- Solder flex fuel input line as pictured to lower solder pad
- For the Nistune flex converter, power the unit using the 5 volt output from the middle pin of the voltage regulator as marked



8. S14 SR20DET ECU

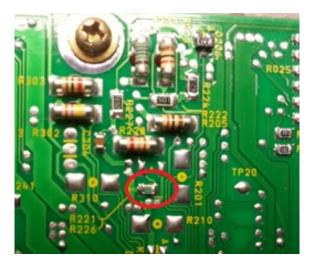


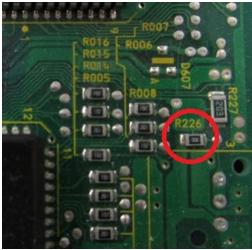


- Remove resistors J200 and J201
- Solder flex fuel input line as pictured to lower solder pad
- For the Nistune flex converter, power the unit using the 5 volt output from the middle pin as marked

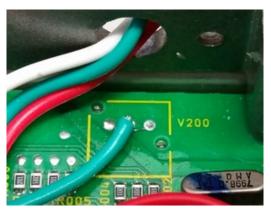


9. S13 SR20DET (Type R/X) / S14A SR20DET / S15 SR20DET / P11 SR20DE ECU





S13 (Type X) // S14A/P11 ECU rear of ECU. S15 next to diagnostic connector





- Removed marked resistor R226
- Solder flex fuel input line as pictured to middle solder pad of V200
- For the Nistune flex converter, power the unit using the 5 volt output from the middle pin of the voltage regulator as shown



10. ER34 / WC34 RB25DET / Y33 VQ30DE ECU







- Remove resistor R347
- Solder flex cable as marked to LHS pad of V300
- For the Nistune flex converter, power the unit using the 5 volt output from the middle pin of the voltage regulator as shown



Launch Control Operation

External Switch Trigger

Launch control can be triggered either using the speed input, or using an external switch. Disconnect the Power Steering line from the ECU and connect directly to a clutch switch to trigger the launch control externally.

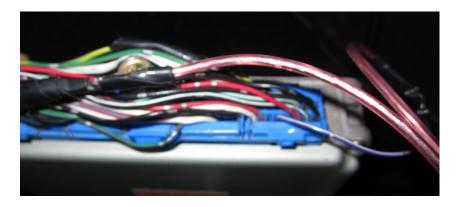
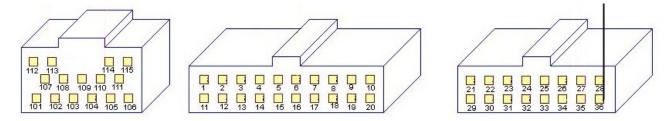


Image: Wiring external trigger between ground and power steering line

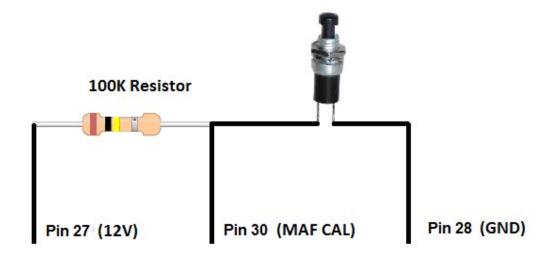
Z31 VG30 / R31 RB30 / VL RB30

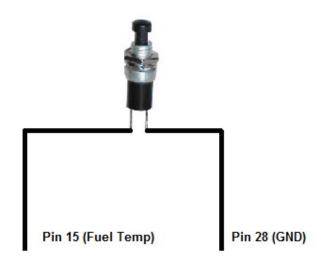


Pin 28 - Ground Pin 27 - 12V power

RB30

Pin 30 - MAF calibration signal (RB30 only). Wire as per below (active GND) with 12V pullup via resistor





S13 CA18DET

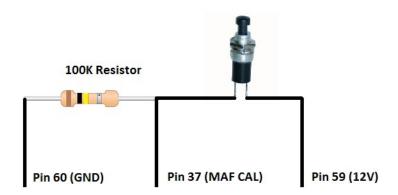
10	1 1	102	2 1	03	1	84	11	15	106	1	07	108	3	1	2	T	3	4	T	5	6	7	8	9	1	0
10	9 1	110	9 1	11	1	12	11	3	114	1	15	116		11	1	2	13	14	ŀ	15	16	17	18	15	3 2	0

Pin 37 - MAF Calibration signal (non-cat models have a line, cat models will need this pin inserted)

Pin 60 - Ground

Pin 49 - 12V power

To reuse the MAF calibration signal, hold down the line using around 100K ohm resistor and use a pull up to 12V via clutch switch or similar. We use pull up here because of capacitance held on the line.



Other ECUs

Cut the power steering line at the ECU and connect to a shielded cable with shield connected to ground. The switch can be operated by clutch or otherwise. A momentary push of the switch will enable/disable the launch control output.

S14 SR20DET, HCR32 RB20, BNR32 RB26, Z32 VG30 etc

Pin 19 – HCR32 / BNR32: Power steering switch trigger

Pin 34 - S14 SR20DET/Z32 VG30: Power steering switch trigger

Pin 60 – Ground

101	10	2 1	03	184	1	185	106	187	108	1	2		3	4	5	6	7	8	9	10	2	1 2	22	23	24	25	26	27	28	29	30	41	42	43	44	45	46	47	48	49	50
109	11	0 1	11	112	1	13	114	115	116	11	1 1	2	13	14	15	16	17	18	19	20	3	1 :	32	33	34	35	36	37	38	39	40	51	52	53	54	55	56	57	58	59	60

S13/S14A/S15 SR20DET etc

Pin 43 – S13/S14A/S15/P11: Power steering switch trigger

Pin 39 - Ground



ER34/WC34 RB25DET

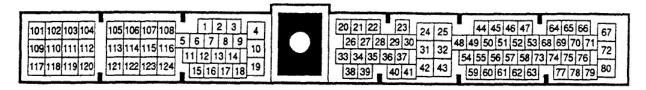
Pin 26 – Power steering switch trigger

Pin 25 - Ground

A32 VQ30DE

Pin 39 – Power steering switch trigger

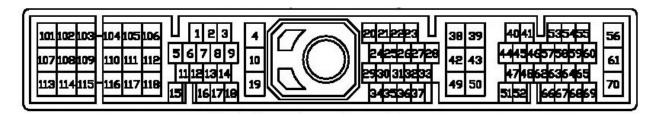
Pin 25 - Ground



S14 KA24DE/B14 SR20DE

Pin 25 – Power steering switch trigger

Pin 32 - Ground



Variable Cam Timing Output

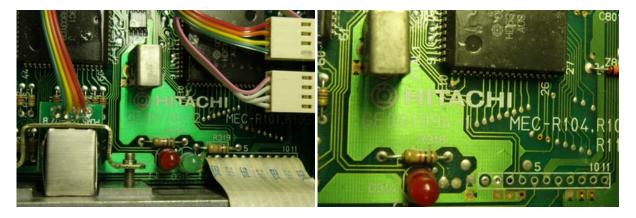
Special firmware updates have been made for HCR32 RB20DET and A31 RB20DET ECUs for triggering VCT output using existing ECU outputs when these ECUs are used with RB25DET engines. There are three flavours of firmware depending on ECU and if air conditioning is required

Spare LED output (23710-04UXX R32 ECU, 23710-74Lxx/79Lxx A31 Cefiro ECU)

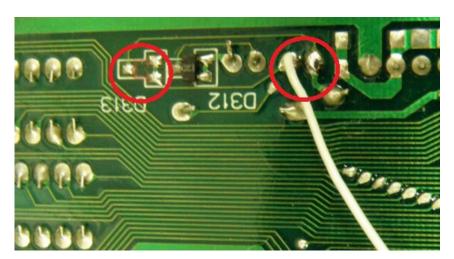
1. Utilise spare GREEN diagnostic LED (Available A31 and early R32 ECUs only)

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

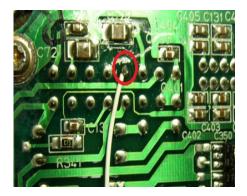
HCR32 ECUs must be part number 23710-04UXX or MEC-R1XX which have the placement for the second LED on the circuit board



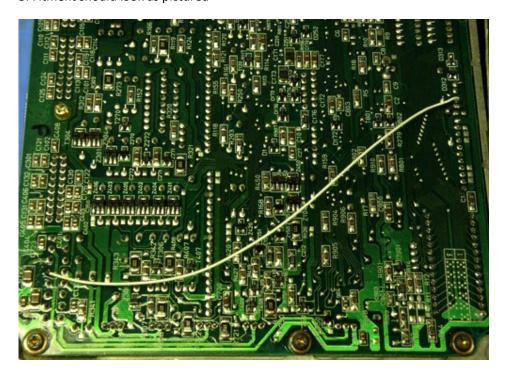
- 2. A31 RB20DET: Remove or cut Diode D311 (located top side of ECU, near ECU plug and T300 transistor). This diode connects to the Exhaust Temp warning lamp in the R33. Optional: Remove the GREEN LED (if fitted and supporting diode on reverse side of the ECU)
- 3. Solder the VCT line where shown



4. Solder to pin 113 as pictured



5. Fitment should look as pictured



RB25DET using RB20DET ECU

Fuel Pump Idle Control output (23710-11UXX/04UXX R32 ECU)

1. Remove Fuel Pump Control idle output.

101	1	02	1	03	10	4	18	10	6	107	108	1	1	2	3	4	5	6	7	8	T	9	10
105	9 1	10	1	11	11	2	11:	11	41	115	116	1	1	12	13	14	15	16	17	18	1	9	20

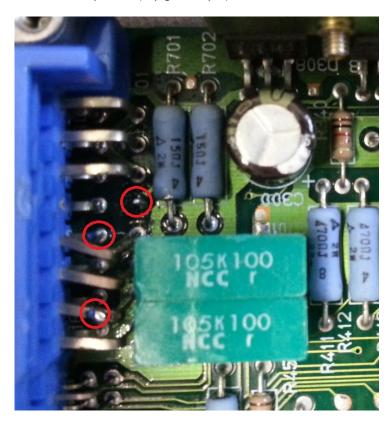
Pin 104 - Controls idle fuel pump voltage to Fuel Pump Control Module (FPCM). When installing an aftermarket high flow fuel pump, it should be controlled directly from the fuel pump relay rather than FPCM.

This ECU output is normally used to vary fuel pump idle speed with the factory fuel pump. This pin will no longer be used and the output from the ECU will control the VCT

HCR32_FOR_RB25_11U0F_MT_TPS_VCT_VFCOUT_v5_FP.ENT

- 1. Cut pin 104 from ECU connector to pad on board, leaving about 2mm exposed from board.
- 2. Slightly push other pins to access pin 113

Add solder to pin 104 (from ECU board)
Add solder to pin 113 (VCT from connector)
Add solder to pin 107 (top ground pin)



- 3. Source BD679 Darlington Transistor (SOT-32 package) and pre-tin (solder) ends of transistor Available from Farnell (Element-14) and other electronics specialists
- 4. Solder transistor to ECU with shiny shielded side facing upwards

Pin 1 (Base) - Solders to pin 104 coming from the circuit board

Pin 2 (Collector) - Solders to pin 113 coming from ECU plug (VCT output)

Pin 3 (Emitter) - Solders to pin 107



5. Vehicle will operate as normal with VCT operation now allowed, and Fuel pump idle disabled.

Alternate transistor:

 $\frac{\text{http://www.jaycar.com.au/Active-Components/Discrete/Transistors----General-Purpose/BD681-NPN-}{\text{Transistor/p/ZT2193}}$

BD681 (1 = Emitter, 2 = Collector, 3 = Base)

VCT Control using RB26DETT ECU

Fuel Pump Idle Control output (23710-05U6F with VCT firmware from Sep 2016 onwards)

1. Remove Fuel Pump Control idle output.

101 102 103 104 105 106 107 108	1	2	3	4	5	6	7	8	9	10
109 110 111 112 113 114 115 116	11	12	13	14	15	16	17	18	19	20

Pin 104 - Controls idle fuel pump voltage to Fuel Pump Control Module (FPCM). When installing an aftermarket high flow fuel pump, it should be controlled directly from the fuel pump relay rather than FPCM.

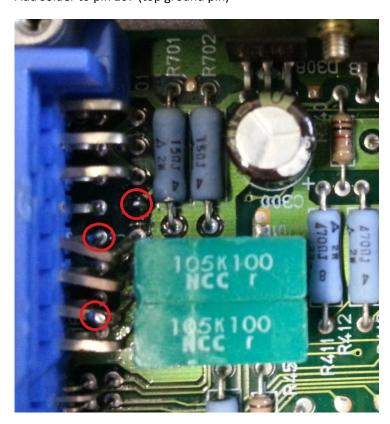
This ECU output is normally used to vary fuel pump idle speed with the factory fuel pump. This pin will no longer be used and the output from the ECU will control the VCT

BNR32_RB26DETT_05U6F_MT_MECR282A_TPS_FP.ent BNR32_RB26DETT_05U6F_MT_MECR282A_TPS_VCT_FP.ent

(Files must be from Sep 2016 onwards, otherwise VCT signal is inverted)

- 1. Cut pin 104 from ECU connector to pad on board, leaving about 2mm exposed from board.
- 2. Slightly push other pins to access pin 113

Add solder to pin 104 (from ECU board)
Add solder to pin 113 (VCT from connector)
Add solder to pin 107 (top ground pin)



3. Source BD679 Darlington Transistor (SOT-32 package) and pre-tin (solder) ends of transistor *Available from Farnell (Element-14) and other electronics specialists*

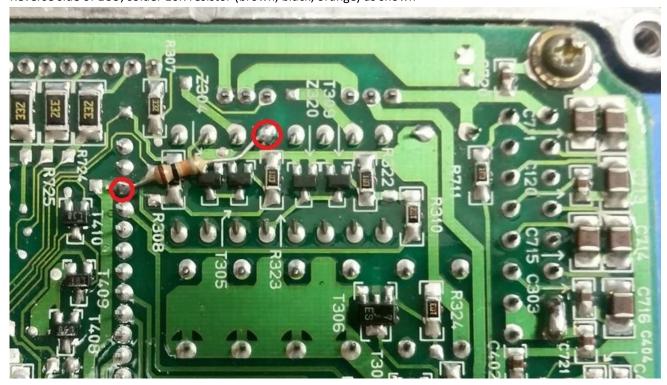
4. Solder transistor to ECU with shiny shielded side facing upwards

Pin 1 (Base) - Solders to pin 104 coming from the circuit board via resistor 39K ohm (orange/white/orange)



Pin 2 (Collector) - Solders to pin 113 coming from ECU plug (VCT output) Pin 3 (Emitter) - Solders to pin 107

Reverse side of ECU, solder 10K resistor (brown, black, orange) as shown



5. Vehicle will operate as normal with VCT operation now allowed, and Fuel pump idle disabled.

RB25DET using RB20DET ECU

Air Conditioning output (23710-11UXX R32 ECU)

1. 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

Pin 113 - ECR33 RB25 - VCT output solenoid

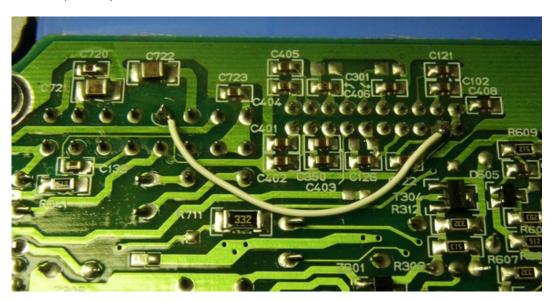
Pin 9 - Air conditioner relay

16	1 1	02	103	3 16	14	105	106	187	108	1	2	3	4	5	6	7	8	9	10	21	1 2	2 23	24	25	26	27	28	29	38	41	42	43	44	45	46	47	48	49	50
10	9 1	10	11	1 11	2	113	114	114	116	11	12	13	14	15	16	17	18	19	20	31	3	33	34	35	36	37	38	39	40	51	52	53	54	55	56	57	58	59	60

2. Cut pin 9 from ECU



3. Solder pin 9 to pin 113



SR16/SR20VE pinouts

SR16VE – VVL solenoid (INT) = pin 102

SR16VE - VVL solenoid (EXH) = pin 106

SR20VE using P11 SR20DE ECU

PIN 114 – Evaporative Canister Purge Solenoid (wire this pin 114 to VVL pin inside the ECU)



SR20VE using B13/N14/S13 SR20DE/S13 SR20DET ECU

B13/P10 SR20DE: PIN 102 - Canister Purge Solenoid (as is)

S13/N14 SR20DE: PIN 105 – EGR Output solenoid (wire to VVL pin inside the ECU)

S13_SR20DET_50F0F_MT_red_top_VCT_FP.ent

S13 SR20DET: PIN 102 for VCT out. Only available with VCT firmware version

SR20VE second trigger AC output using B13/N14/S13 SR20DE ECU

Reprogram board using ENT file with firmware update for AC output (Second VVL pin)

B13_SR20DE_64Y0F_MT_VCT2_FP.ent,

B13_SR20DE_67Y0F_MT_VCT2_FP.ent

B13_SR20DE_71Y0F_MT_VCT2_FP.ent

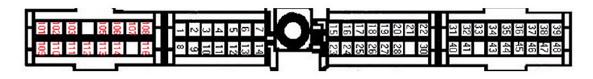
N14_SR20DE_68C0F_MT_VCT2_FP.ent

P10_SR20DE_70J0F_MT_VCT2_FP.ent

S13_SR20DE_52F0F_MT_VCT2_FP.ent

B13/S13/N14 SR20DE: PIN 11 – Air Conditioner relay out (wire to VVL pin inside the ECU)

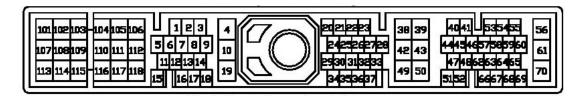
Notes: SR20VE uses VCT solenoid with as negative trigger



SR20VE using B14 SR20DE ECU

PIN103 - EGR Canister Purge Solenoid (wire EGR solenoid lines in engine bay to SR20VE VCT solenoid)

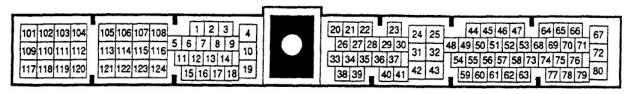
Notes: SR20VE VCT Pin works as negative trigger



A32 VQ30DE ECU – VCT version firmware

Pin 103 – EGR Output solenoid (route from existing EGR connector with 12V other side to VCT solenoid)

Pin 72 – ECCS power (12V)



Feature Pack 2 - Boost Control

Boost Control

S14 SR20DET

Pin 25 is the Wastegate Valve Control. Remove connector from valve and reuse for boost control solenoid.

				20							77														9												8.5	157			6.00				70		
101	1 1	02	10	13	10	1	185	18	6 1	87	108	3	1	2	T	3	4	5	T	6	7	8	9	10	2	1 2	2	23	24	25	26	27	28	29	30	41	42	4	3	44	45	46	47	48	49	50	
105	1	10	11	1	112	1	13	11	1 1	15	116		11	1:	2	13	14	15	,	16	17	18	19	20	3	1 3	2	33	34	35	36	37	38	39	40	51	52	5	3	54	55	56	57	58	59	60	

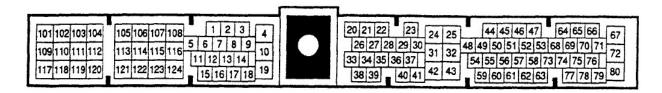
S14A/S15 SR20DET

Pin 102 is Wategate Control (S14A) or Pin 115 for (S15). Remove connector from valve and reuse for boost control solenoid.



ER34/WC34 RB25DET

Pin 108 Canister Purge control valve output is reused (remove connector from valve and use both wires for the boost control solenoid)



To reuse factory boost control output:

- 1. Cut wire at pin 108 (Canister purge PWM signal)
- 2. Cut wire at pin 104 (boost valve signal)
- Then connect wire 108 (from ECU plug) to 104 (to loom)
 This will connect PWM output to boost control. Canister purge valve stays closed from now
- 4. Remove factory boost control solenoid and replace with 3 port MAC valve



Note: Check your boost solenoid function by setting 'duty cycle' in the boost control map, and check **the 'wastegate solenoid'** output gauge inside Nistune. Check that this matches your solenoid output using 'duty cycle' output on your multimeter.

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