



TYPE #4



Hardware Installation – Type 4 boards

(JECS 1990-1998 Engine Control Units)

Vehicle application list

B14	NX2000	SR20DE	to 1995 only
N15	Pulsar	GA16DE	
N15	Almera Gti	SR20DE	
P11	Primera	SR20DE	3Jxx series ECU's
G20	Infiniti	SR20DE	to 1995 only
S13	180SX late	SR20DET	Type X/R (60Fxx series ECU's)
S14A	Silvia/200SX	SR20DET	
S15	Silvia/200SX	SR20DET	
W10	Avenir	SR20DET	Late (97>) W10 only (95N15)
S14	240SX	KA24DE	to 1995 only
ER34	Skyline	RB25DET	
WC34	Stagea S2	RB25DET	JECS ECU only (NEO engine)
U13	Altima	KA24DE	to 1995 only
Y33	Cedric	VQ30DET	
K11	Micra	CG13DE	"facelift" model 98-02

Copyright 2004 – 2010 NISTune Developments

INTRODUCTION

Welcome to NIStune.

The NIStune hardware and software solution provides a means for the car enthusiast to retune their vehicle whilst retaining their factory ECU and its default programming.

This solution provides many advantages over aftermarket ECUs in that the:

- Factory default tuning is maintained once the NIStune board is installed. Upon installation of the board, vehicle will be operational as usual.
- Additional tuning can then be made against the factory maps for modifications made to the vehicle. There is no need to tune the car to get it running from scratch, reducing time and costs of tuning required on dyno.
- There is no need for wiring loom modifications.

NIStune provides real-time tuning and maptracing. It provides the ability to make changes to the factory ECU while it is running the vehicle. When the desired results are achieved they are saved permanently to the NIStune real-time board (in non-volatile memory).

NIStune also provides data logging and playback facilities using the Nissan Consult Port. NIStune software also provides a user friendly, responsive graphical interface to perform modifications.

Contained in this manual are the instructions for installing a NIStune board into the Nissan (JECS) ECU's containing the Mitsubishi 7700 series microcontroller. These ECU's support the use of the "Consult" diagnostic port – through which NIStune communicates.

TERMS AND CONDITIONS

Nistune Developments has performed necessary measures to ensure that the Nistune software and boards are built to high standards. By using this product you agree to the following terms:

IMPORTANT - READ CAREFULLY: This License Agreement (**Agreement**) is a legal agreement between you and Nistune Developments for the software product Nistune (**Software**) and any computer chips, circuit boards or any other physical carrier or medium on which the Software is loaded or programmed (**Hardware**). The Software includes computer software and programs, printed materials and electronic documentation. By installing the Software and Hardware, copying or any other use of the Software, you agree to the terms of this Agreement. If you do not agree to the terms of this Agreement, you are not allowed to use or copy the Software.

1. GRANT OF LICENSE

Individual User Licence:

If you purchase an Individual User Licence, you are granted a licence as a single user of the Software And are authorised to install and use it on up to five (5) vehicles, but you may not install the Software for any other person, and may only make a single backup copy of the Software.

Commercial User Licence:

If you purchase a Commercial User Licence, you are granted a licence as a commercial user of the Software And are authorised to install and use it on an unlimited number of vehicles, but you may not install the Software for any other person, unless you have a written Reseller Agreement with Nistune Developments, and may only make a single backup copy of the Software.

Use of the software by both Individual and Commercial Users:

The Software may be installed on multiple computers belonging to you for so long as those machines remain your property. Regardless of other rights, the author of the software product is allowed to terminate this license agreement if you offend against the terms and conditions of this agreement. If so, you will have to remove and destroy all copies of the Software and its components.

2. INTELLECTUAL PROPERTY RIGHTS

You may not copy, modify or distribute the Software except under the terms given in this Agreement. You may not sublicense the Software or in any way place it under any other licence than this one. The Software is protected by the intellectual property laws of Australia and international intellectual property treaties. You acknowledge that no intellectual property in the Software passes or accrues to or vests in you and that your rights in the software are limited to such use as is specified in this Agreement.

3. TITLE AND RISK

At all times, title in the Software remains with Nistune Developments. Risk in the Software and Hardware passes to you upon despatch to you.

4. TERM

Your licence is effective upon your acceptance of this agreement and installing the Software and Hardware. This agreement will continue indefinitely unless terminated by reason of your breach of this Agreement.

5. DECOMPILING

You agree not to reverse engineer or allow a third party to reverse engineer the Software, change, split, decompile, disassemble or translate the Software in part or in whole, without prior written consent from Nistune Developments, or except as permitted under applicable law.

6. RESALE

Resale by Individual Users:

A holder of an Individual User Licence may only sell that licence to a third party if:

- a. Nistune Developments consents to the sale in writing; and
- b. the third party agrees in writing to be bound by identical obligations to those in this Agreement.

If you sell your Individual User Licence, you are no longer authorised to use the Software. Resale of your Individual User Licence does not enable the Software to be used on more than five vehicles in total.

Resale by Commercial Users

If you hold a Commercial User Licence, the Software may only be resold by you if you have a current written Resellers Agreement with Nistune Developments. Only Commercial User Licence holders may obtain Resellers Agreements. In reselling the Software, you agree that:

- a. you will ensure that any person you sell the Software to (**Your Clients**) execute an agreement in favour of Nistune Developments in similar form to this Agreement, obliging Your Clients to observe like obligations to those of an Individual User under this Agreement; and
- b. You agree to indemnify us against all claims, losses, costs, liability and damages which we may incur, whether directly or indirectly, in connection with or arising from:
 - i. any claim whatsoever brought against us by Your Clients relating to their use of the Software;
 - ii. the use of the Software by you or Your Clients;
 - iii. the unauthorised replication of the Software or onsale of the Software by Your Clients;
 - iv. your installation of the Software on Your Client's computer;
 - v. your breach, our Your Clients' breach, of this Agreement; or
 - vi. any other action by Your Clients related to their purchase of the Software from you.

For the avoidance of doubt, this indemnity shall extend (without limitation) to any third party claims against us, any loss or damage to property, and any injury to, or death of, any person.

7. INDEMNITY

You indemnify us against all claims, losses, costs, liability and damages which we may incur, whether directly or indirectly, in connection with or arising from:

- any negligent act, omission or wilful misconduct by you or your officers, employees, subcontractors or agents in the use of the Software or Hardware;
- any defect in your installation of the Software or Hardware, or your use of the Software or Hardware; or
- your breach of the Terms.

For the avoidance of doubt, this indemnity shall extend (without limitation) to any third party claims against us, any loss or damage to property, and any injury to, or death of, any person.

8. UPDATES

Nistune Developments may, from time to time, revise or update the Software or Hardware. In so doing, Nistune Developments incurs no obligation to furnish such revision or updates to you.

9. WARRANTY

The author of this Software has verified as best as possible that the main features and functions of the Software and Hardware work as described when used normally on compatible equipment. Due to the complexity of computer software, we can not guarantee that the software or documents do not contain errors or works without

intermissions on any equipment and software configuration. To the extent permitted by law and except as set out in this Agreement, all express or implied warranties, guarantees and conditions relating to the Software and Hardware, however arising, are excluded.

10. DISCLAIMER OF LIABILITY

NO LIABILITY FOR CONSEQUENTIAL DAMAGES. IN NO EVENT SHALL NISTUNE DEVELOPMENTS BE LIABLE FOR ANY SPECIAL, INCIDENTAL, INDIRECT, OR CONSEQUENTIAL DAMAGES WHATSOEVER (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION, OR ANY OTHER PECUNIARY LOSS) ARISING OUT OF THE USE OF OR INABILITY TO USE THE SOFTWARE OR HARDWARE, EVEN IF NISTUNE DEVELOPMENTS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

IN NO EVENT WILL NISTUNE DEVELOPMENTS BE LIABLE FOR ANY COMPUTER DAMAGE, VEHICLE DAMAGE, PERSONAL INJURY, DEATH, FINES, LAWSUITS, PROSECUTION, LOST PROFITS, LOST DATA, INCORRECT DATA, ENVIRONMENTAL DAMAGE, GOVERNMENT, LAW AND REGULATORY VIOLATIONS OR ANY OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES THAT RESULT FROM USE OR INABILITY TO USE THE SOFTWARE OR HARDWARE

THE SOFTWARE AND HARDWARE IS NOT INTENDED FOR USE IN OPERATION OF MOTOR VEHICLES AND/OR MACHINES WHERE THE USE, FAILURE OR MISUSE OF THE SOFTWARE OR HARDWARE COULD LEAD TO DEATH, PERSONAL INJURY OR PHYSICAL OR ENVIRONMENTAL DAMAGE AND OR VIOLATE ANY ENVIRONMENTAL, SAFETY, TRANSPORTATION OR OTHER LAWS OR REGULATIONS.

IT IS THE USER'S RESPONSIBILITY TO OBTAIN ANY CERTIFICATION, RECERTIFICATION OR NEW CLASSIFICATIONS PERTAINING TO USE OF THE SOFTWARE AND HARDWARE. IF ANY WARRANTY OR CONDITION IS IMPLIED BY THE TRADE PRACTICES ACT 1974 (CTH) OR OTHER RELEVANT LEGISLATION WHICH MAY NOT BE EXCLUDED THEN OUR LIABILITY OF ANY BREACH OF SUCH AN IMPLIED WARRANTY IS LIMITED SOLELY TO THE RESUPPLY OF THE RELEVANT GOOD OR SERVICE OR PAYMENT TO YOU OF THE COST OF HAVING THE GOOD OR SERVICE PROVIDED AGAIN (AT OUR OPTION) . SOFTWARE AND HARDWARE INSTALLATION REMAINS THE SOLE RESPONSIBILITY OF THE VEHICLE OWNER.

11. GENERAL

This License is personal between you and Nistune Developments. It is not transferable except in accordance with this Agreement, and any attempt by you to rent, lease, sublicense, assign or transfer any of the rights, duties or obligations hereunder, is void. This Agreement and the conduct of the parties hereto shall be governed by the laws of South Australia.

YOU ACKNOWLEDGE THAT YOU HAVE READ THIS AGREEMENT, UNDERSTAND IT AND AGREE TO BE BOUND BY ITS TERMS AND CONDITIONS. YOU FURTHER AGREE THAT IT IS THE COMPLETE AND EXCLUSIVE STATEMENT OF THE AGREEMENT BETWEEN YOU AND NISTUNE DEVELOPMENTS WHICH SUPERSEDES ANY PROPOSAL OR PRIOR AGREEMENT, ORAL OR WRITTEN, AND ANY OTHER COMMUNICATIONS BETWEEN YOU AND NISTUNE DEVELOPMENTS RELATING TO THE SOFTWARE AND HARDWARE.

TABLE OF CONTENTS

• Remove front and rear covers from the ECU.....	5
• Remove conformal coating from areas to be soldered.....	5
• Remove solder from the pads.....	6
• Check that holes are clear	7
• Fit the Adaptor assembly	8
• Tips and techniques.....	9
• Change jumper settings	11
• Fit board to adaptor	12
• Fit board to ECU	12
• Appendix	14
Revision History.....	15

- **Remove front and rear covers from the ECU**



Tip : The screws that secure the covers will have thread locking compound applied from factory. This stuff really hangs on so make sure you use a driver with a tip which fits the screw head properly. We use a cordless drill. This may seem somewhat excessive but the combination of quality screwdriver tips available and being able to use an adjustable clutch makes for a very effective tool.

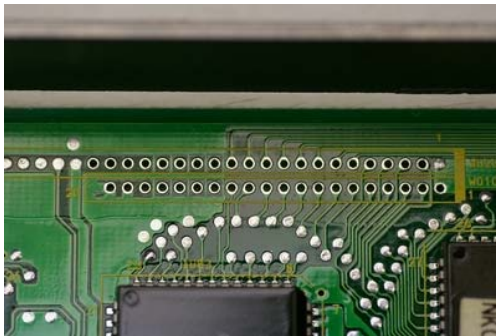
- **Remove conformal coating from areas to be soldered**



Using solvent or contact cleaner remove the coating around the header area on both sides of the board and around the SMD jumpers (see later in document for photos).

- **Remove solder from the pads**

Using a de-soldering gun with a small tip carefully remove the solder for the connector matching your ECU type. This is best performed from the rear of the board.



Pads de-soldered for Adaptor A

Adaptor A (SR20DET from Late S13 180SX, S14A & S15, UK N15 Almera GTi, P11 Primera, Late W10 Avenir, Late K11 Micra 98-02).

On W010 (20 pads) de-solder pads 1 - 20
On W020 (30 pads) de-solder pads 2 – 21

Note the 1 pad offset between the two rows.

Adaptor B (S14 KA24DE/U13 KA24DE/Y33 VQ30/N15 GA16DE).

De-solder the W001 row of pads 1 - 40 (outside row)



Pads de-soldered for Adaptor B



Adaptor C (RB25DET from ER34/late Stagea).

De-solder the W100 row of pads 1 - 40 (inside row)

Autos will have the outside row of pads already used by a board containing auto control circuitry, as shown in this photo. You may need to carefully bend this board towards the ECU wall.

Tips: The best way to de-solder the pads is to run a line of flux down the row of pads you intend to work on. This will provide a heat-bridge between the de-soldering gun and the solder in the pads. Do not push on the pads otherwise you will damage them – try to hold the iron so it only just touches the pad.

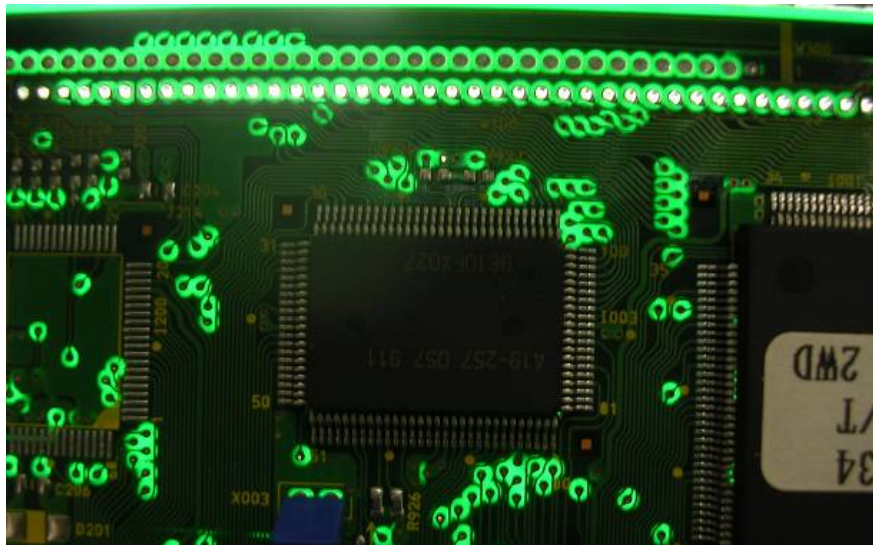
Note that these ECUs use multi layered boards. The middle layer usually consists of ground and VCC copper planes. These absorb a lot of heat and make the de-soldering process quite difficult, due the amount of temperature they soak up from the gun.

These planes will connect to pads on these connectors, where one pad (pin 1) is VCC plane and two pads (19/20 on Adaptor A boards and pin 39/40 on Adaptor B/C boards) are ground planes. A good quality iron will remove the solder from these pads without a problem, although you may need to increase the time on the pad from the usual 0.5 – 1 second to 1 – 3 seconds.

Another technique is to stand the ECU vertically and use the de-soldering iron from one side of the board and a soldering iron from the other side. This heats the solder from both sides of the pad. This is a particularly effective method but requires considerable skill and is ideally done with help from an assistant.

Warning: Pads on these ECUs are very delicate. Don't attempt this unless you have the right equipment. It's quite easy to damage the board. Don't overheat the pads (about a second per pad is a safe maximum) or damage can easily result. If in doubt get somebody with the right equipment to do it for you.

- Check that holes are clear



Hold the ECU up to the light and check that all the holes are clear. If any holes still have solder in them do not try to clear them out using a drill bit! The boards are multi-layer and it is quite likely that an internal connection will be damaged.

If some holes are not clear then reapply solder to both sides of the hole – this helps create a more effective “heat bridge” between the iron and the solder. Then re-attempt de-soldering. It's usually only pads that connect to power or ground that cause problems.

It is very important the holes are completely clear, otherwise it will make the next step impossible when attempting to insert the strip connectors.

Clean the row(s) of pads on both sides of the board with solvent and inspect to ensure there are no solder slivers/bridges/blobs between any pads.

- **Fit the Adaptor assembly**

Type 4 boards are supplied with an adaptor board for your ECU type. They use a delicate flex strip cable. Be careful not to bend the ends of the cable when fitting through the de-soldered holes in your ECU.

Ensure the cable is facing the correct orientation. Trial fit the board inside your ECU and make sure the adaptor cable will mate up properly. Square pad on the adaptor board matches up to pin 1 on the ECU (except for W020 on the Type A adaptor which is offset by one pin and so goes to pin 2 on the ECU end).



Adaptor A



Adaptor B

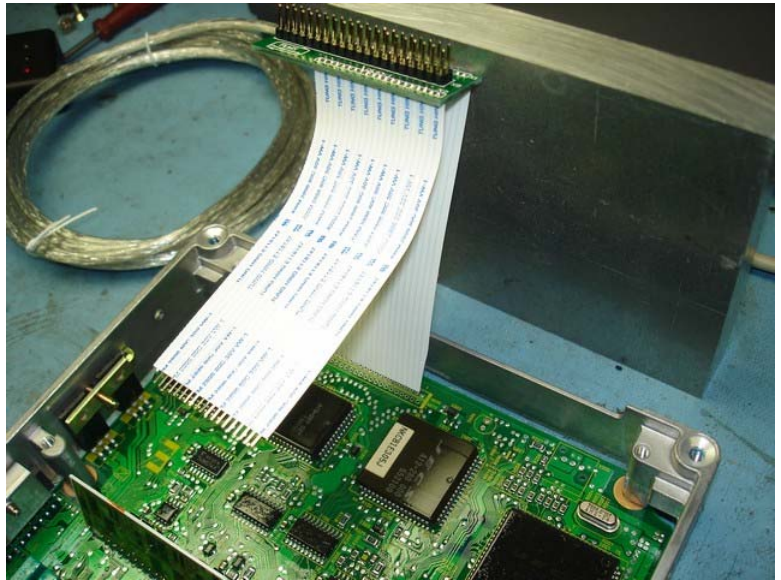


Adaptor C

- **Tips and techniques**

Feed the tips of the ribbon cable into the holes and then support the adaptor as shown. Working from the inside of the ECU, carefully solder two pads from the top to hold the adaptor in place. Take care not to short adjacent pads or melt the insulation of the ribbon cable. Clean around the pads with acetone/solvent and a cotton bud.

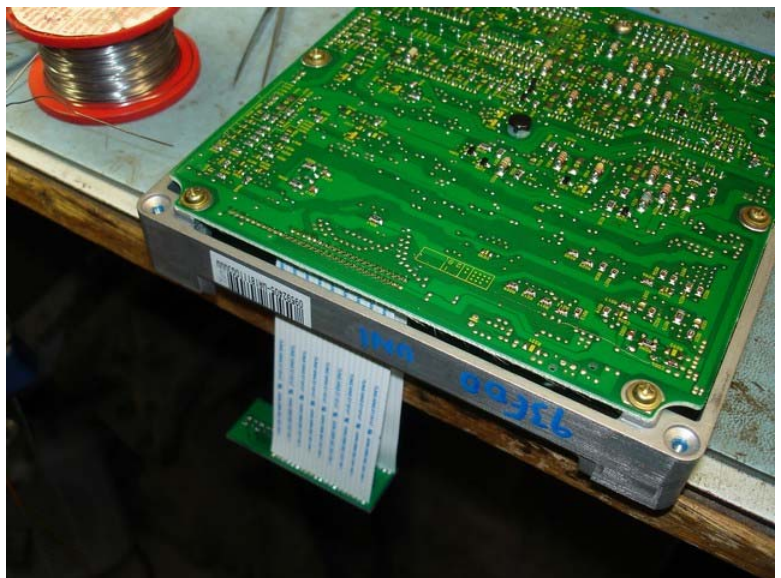
For Adaptor A bend one ribbon cable out of the way to gain access to the other as shown.



Photos show pads on each end soldered but you may find it easier to solder pads further in as end pads connect to power/ground planes making them more difficult to solder.

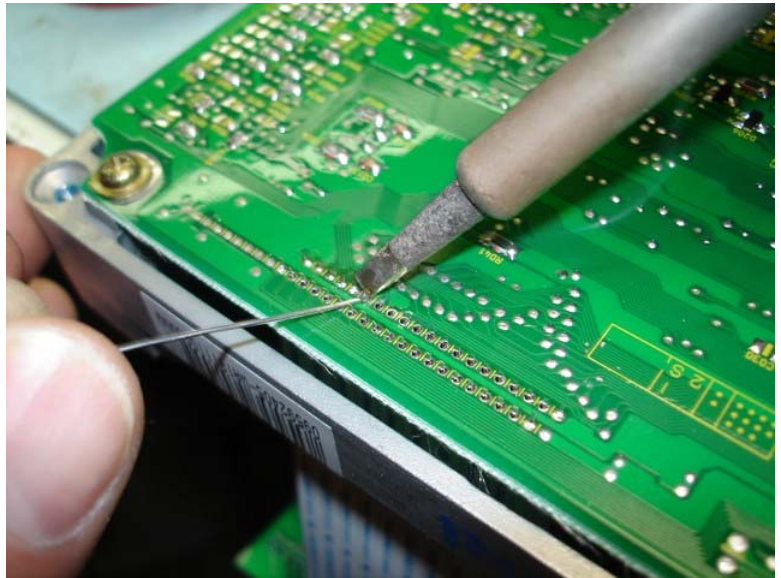


Turn the ECU over and place it so that the adaptor hangs over the edge of the bench.



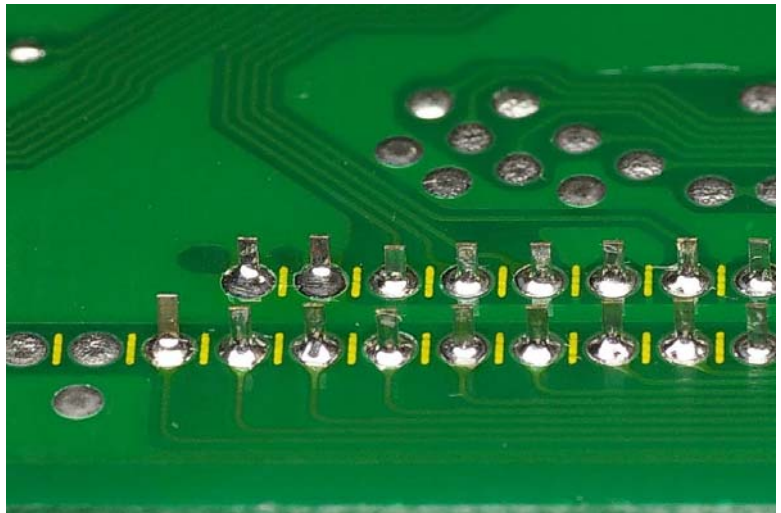
Now you can solder away. Ensure the solder flows right through. Extra time may be required on the end pads due to power/ground planes. A large “chisel” style tip is ideal for this rather than increasing heat.

Note size of tip in use in the photo - using the corner of a large tip with thin gauge solder is a very effective technique. And the two ground pins can be soldered simultaneously – giving very effective heat transfer. No problems getting solder to flow through to other side of board here!



Clean off flux with acetone or similar solvent. Inspect solder joints with eyeglass.

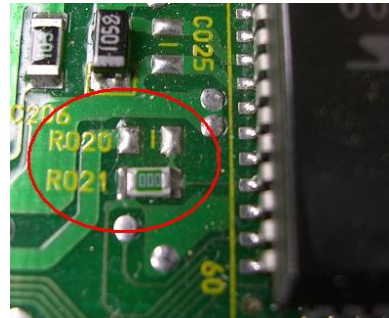
Watch out for solder slivers between pads and make sure solder has flowed through to the top side of the board. Poor soldering is the number one cause of problems.



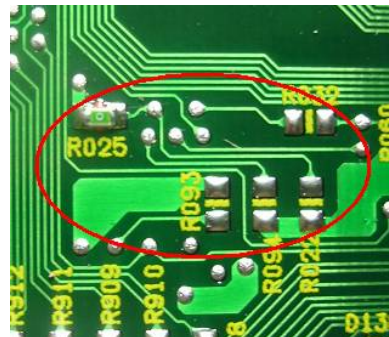
- **Change jumper settings**

Jumpers are used on the ECU to tell the micro to read from either factory code (located in a memory chip on the ECU main board) or from our daughterboard.

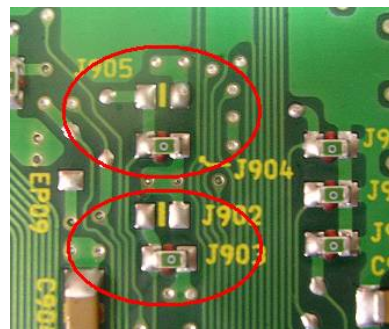
For late 180SX, S14A, S15, UK N15 Almera GTi, P11 Primera & late W10 Avenir these jumpers are on top side of the ECU. Move jumper R021 to position R020. Actual positions may vary slightly between ECU's. K11 (98-02) Micra has jumpers on rear of ECU.



For U13 KA24DE (1995-1996), S14 KA24DE (1995), B14 SR20DE (1995), G20 SR20DE (1995-1996), N15A GA16DE, B14 GA16DE jumpers are on the bottom side of the ECU. Move Jumper R025 to position R022



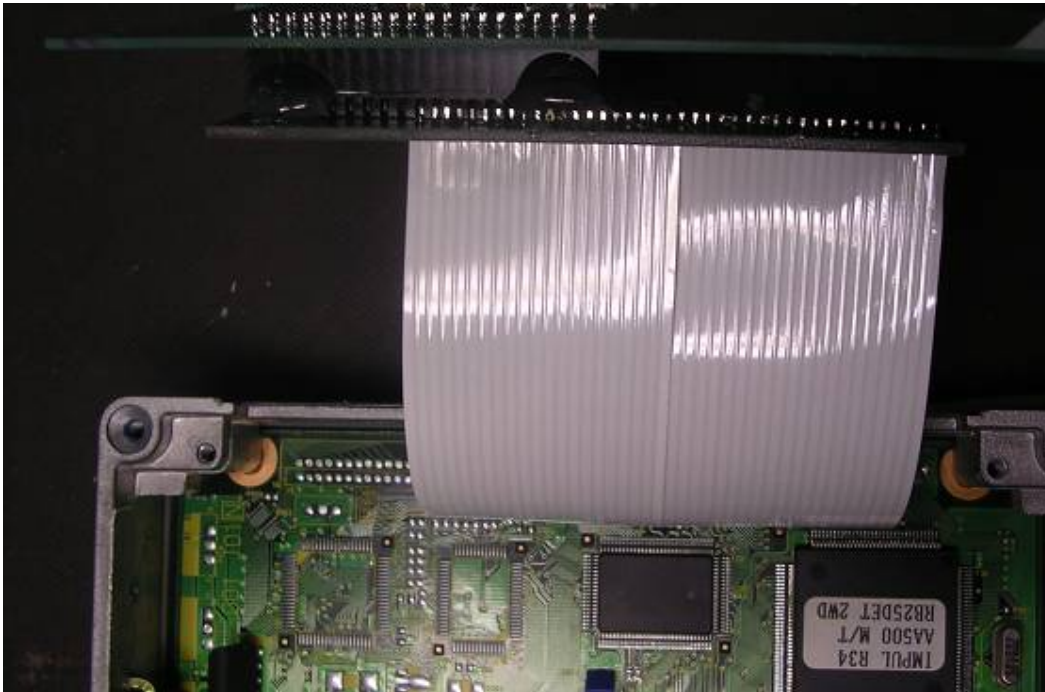
For ER34 RB25DET, WC34 Stagea RB25DET, B14 SR20DE (1996 OBD-II) these jumpers are on the bottom side of the ECU. Move jumpers J903 to J902 and then J904 to J905



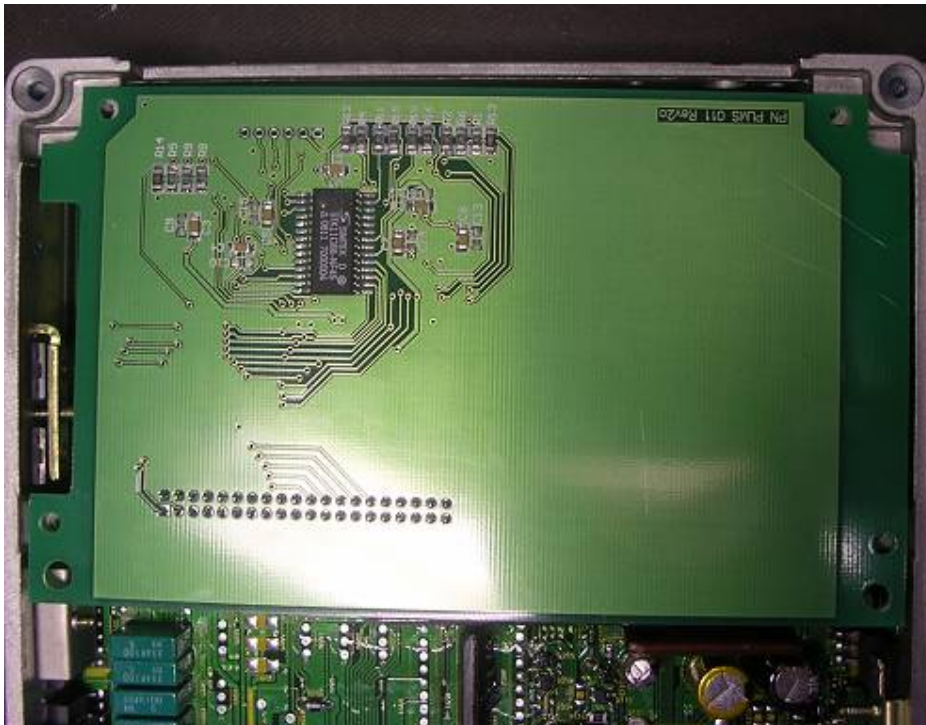
For Y33 move J923 to J922 (on back of ECU)

- **Fit board to adaptor**

It is recommended to use hot-melt glue (or similar) against the edges of the 20+20 connector to ensure it stays attached to the board. This will prevent the adaptor slipping off if the ECU suffers vibration.



- **Fit board to ECU**



Place the Type 4 daughterboard inside the ECU and ensure that it does not push against any other components. It may be necessary to carefully bend some components back so they do not contact the daughterboard.

Insulating the 20+20 header pins of the board from the lid of the ECU is recommended. There is clearance but it still pays to be sure in case of vibration. A bead of hot melt glue over the pins will suffice. Or several layers of insulating tape on the lid. Later boards have rubber insulating blocks already fitted for this purpose.

Use supplied M3 screws to hold in the Type 4 daughterboard. Sometimes the screw threads may have conformal coating in them from when the ECU had coating applied at the factory – making it difficult to fit the screws. This may need to be removed using solvent or (preferably) by running an M3x0.5 thread tap down the hole.

P11 Primera owners : These vehicles use a Bosch ECU (3Jxx series) and they do NOT have the features to mount the daughterboard. The only way around this is to remove the main board from the ECU and machine (mill + drill) the step + threaded holes into the case or use a case from another Nissan ECU.

Congratulations – you now have a fully tuneable ECU!

*** Special thanks to Steve at FC Tuning for testing of our Type 4 boards in the UK N15 Almera and P11 Primera ***

- **Appendix**

NiStune Board Jumper Settings

Your NiStune board will arrive with a BASE ROM IMAGE programmed and the jumpers set to match your ECU. This should not need to be changed unless the board is to be reprogrammed with a new BASE ROM IMAGE (ie: if the board is used in an ECU with a different part number).

Jumper settings are as below:

PROGRAM MODE

J5 (PGM) = Closed

J1-J3 = Open

ECU OPERATION MODE

J5 (PGM) = Open

Jumper	Model	Name	Engine	Remarks
J2	S14a	Silvia	SR20DET	
	S15	Silvia	SR20DET	
	Y33	Cedric	VQ30DET	
	K11	Micra	CG13DE	"facelift" model 98-02
	P11	Primera	SR20DE	3Jxx series ECU's
J1+J2	U13	Altima	KA24DE	to 1995 only
	S14	240SX	KA24DE	to 1995 only
	N15a	Pulsar	GA16DE	
	N15	Almera Gti	SR20DE	UK model
	B14	NX2000	SR20DE	to 1995 only
J3	S13	180SX late	SR20DET	Type X/R (60Fxx series ECU's)
	ER34	Skyline	RB25DET	
	WC34	Stagea S2	RB25DET	JECS ECU only (NEO engine)
	W10	Avenir	SR20DET	Late model (>97) only (95N15)

Revision History

DATE	VERSION	DESCRIPTION	AUTHOR
Aug08	1.1.1	Initial	MB
Sep08	1.1.2	Fixed minor errors	MB
Nov08	1.1.3	Added extra details and additional images	PL
Jan09	1.1.4	Added details for UK N15 Almera	PL
May09	1.1.5	Updated vehicle application list	PL
Jul09	1.1.6	Added details for late S13 180SX "type X"	PL
Sep09	1.1.7	Added details for late K11 Micra 98-02 & new disclaimer	PL
Jan10	1.1.8	Added details for UK P11 Primera	PL
Mar10	1.1.9	Added details for late W10 Avenir	PL