

PCMHACKING.NET Hardware Requirements

	V6 Normally Aspirated	V6 Boosted	V8
VN Series 1 (All)	808 Comms, ECM NVRAM	808 Comms, ECM NVRAM	808 Comms, ECM NVRAM
VN, VP (All)	808 Comms, ECM NVRAM	808 Comms, ECM NVRAM	808 Comms, ECM NVRAM
VR Manual	ALDL Comms, ECM NVRAM	ALDL Comms, ECM NVRAM	ALDL Comms, ECM NVRAM
VR Auto	ALDL Comms, ECM NVRAM	ALDL Comms, ECM NVRAM	ALDL Comms, ECM NVRAM
VS Manual	ALDL Comms, PCM NVRAM	ALDL Comms, PCM NVRAM	ALDL Comms, ECM NVRAM
VS Auto Series 1,2	ALDL Comms, PCM NVRAM	ALDL Comms, PCM NVRAM	ALDL Comms, ECM NVRAM
VS V8 Auto Series 3			ALDL Comms, PCM NVRAM
VT (All)	ALDL Comms, PCM NVRAM	ALDL Comms, PCM NVRAM	ALDL Comms, PCM NVRAM LS1 Not Supported
VX (All)	ALDL Comms, Delco Flashtool (Software)	ALDL Comms, PCM NVRAM	LS1 Not Supported
VY (All)	ALDL Comms, Delco Flashtool (Software)	ALDL Comms, PCM NVRAM	LS1 Not Supported

- Delco Flashtool software is not real time.
- 4 Cylinder supported with OSE12P
- 4, 6, 8 Cylinder supported with OSE12P
- American '165 ECM compatible with '808. Use ALDL Comms instead of 808 Comms.
- ECM NVRAM = 'the long one', Engine Control Module, used in MAP applications.
- PCM NVRAM = 'the short one', Powertrain Control Module, used in MAF applications.
- NVRAM is pronounced EN-VEE-RAM. It stands for Non-Volatile RAM. Buy PCMHacking genuine as low quality counterfeits are common in some online marketplaces. Counterfeits are known to have a short life expectancy and corrupt your tune.

Product	Link
ECM NVRAM	http://pcmhacking.net/forums/viewtopic.php?f=14&t=3612
ECM Comms Board	http://pcmhacking.net/forums/viewtopic.php?f=14&t=3613
PCM NVRAM	http://pcmhacking.net/forums/viewtopic.php?f=14&t=3617
ALDL Interface	http://pcmhacking.net/forums/viewtopic.php?f=14&t=3616

PCMHACKING.NET Applications

	MAP 1 Bar Normally Aspirated	MAP 2 Bar Max 14.7 PSI Boosted	MAP 3 Bar Max 29 PSI Boosted	MAF Normally Aspirated	MAF BOOST 16Khz, 512 Grams/Sec**
VN S1 V6 OSE 12P APNX	✓	✓	✓	✗	✗
VN, VP, VR V6 Manual OSE 12P BLCD	✓	✓	✓	✗	✗
VN, VP, VR V8 Manual OSE 12P BLCF	✓	✓	✓	✗	✗
VR V6 Auto OSE 11P CAKH	✓	✓	✓	✗	✗
VS V6 Auto The1's Enhanced	✗	✗	✗	✓	✓
VR, VS V8 Auto OSE 11P BLCC	✓	✓	✓	✗	✗
VS V8 Auto Series 3	✗	✗	✗	✓	✓
VT V6 V8 The1's Enhanced	✗	✗	✗	✓	✓
VX V6 The1's Enhanced for boost	✗	✗	✗	~	✓
VY V6 The1's Enhanced for boost	✗	✗	✗	~	✓
4 Cylinder OSE 12P	✓	✓	✓	✗	✗
Throttle Body Injection (4,6,8 cyl) OSE 12P	✓	✓	✓	✗	✗

** 15khz refers to the maximum frequency the MAF can signal. 512grams/second refers to the measurement of the air flowed through the MAF within 1 second. It is significantly more air than factory and is suited to boosted applications. Note that the choice of MAF is important and many MAF clones in circulation cannot meter as much air as their genuine counterparts.

~ Factory Flash PCM with Delco Flash Tool software - not real time

PCMHACKING.NET Hardware Compatibility

ECM/PCM Service number to recommended operating system.

Service Number	Recommended Operating System (OS)
1227808 (aka '808) (VN/VP, N13 Pulsar, LD Astra)	OSE12P (aka 12P or \$12P)
16183082 (aka '082) (VR/VS)	OSE12P (aka 12P or \$12P)
16206305 (VR/VS)	OSE12P (aka 12P or \$12P)
16176424 (aka '424) (VR/VS)	OSE11P (aka 11P or \$11P)
16195699 (RFI) (VR/VS)	OSE11P (aka 11P or \$11P)
16208257 (RFI)	The1's Enhanced
16199728	The1's Enhanced
16234531 (Series 3 VS, VT)	The1's Enhanced
16210672 (factory S/C V6)	The1's Enhanced
16210480 (factory S/C V6)	The1's Enhanced
16233396 (VT NA/SC, VX VY S/C)	The1's Enhanced
09356445 (VX, VY Flash)	Factory

PCMHACKING.NET Software

Links to ECM/PCM Operating Systems

Software	Notes	Requires (Software)	Link
OSE 12P	VL400's MAP based code. Can be used normally aspirated or supports boost with a 2 or 3 bar MAP sensor.	TunerPro RT v5.x OSEPlugin Delco Flash tool	http://pcmhacking.net/forums/viewtopic.php?f=27&t=356
OSE 11P	VL400's MAP based code. Can be used normally aspirated or supports boost with a 2 or 3 bar MAP sensor. Can control a 4L60E electronic auto transmission.	TunerPro RT v5.x OSEPlugin Delco Flash tool	Coming Soon
The1's Enhanced	The1's Enhanced Bins. Adds several new features including end of injection timing, and increases the maximum MAF input frequency. It also allows the PCM to handle calculations of up to 512 grams per second of air (big boost!). It comes in several versions with different levels of features. See the link for more information.	TunerPro RT v5.x OSEPlugin	http://pcmhacking.net/forums/viewtopic.php?f=27&t=2518&p=24673
Realtime factory bins	These are stock factory operating systems, with real time support for tuning. They do not add any features over stock.	TunerPro RT v5.x OSEPlugin	http://pcmhacking.net/forums/viewtopic.php?f=27&t=613
Factory Flash PCMs	Factory code, these PCMs can be reflashed with the Delco Flash tool.	Delco Flash tool	None Provided

PCMHACKING.NET Software

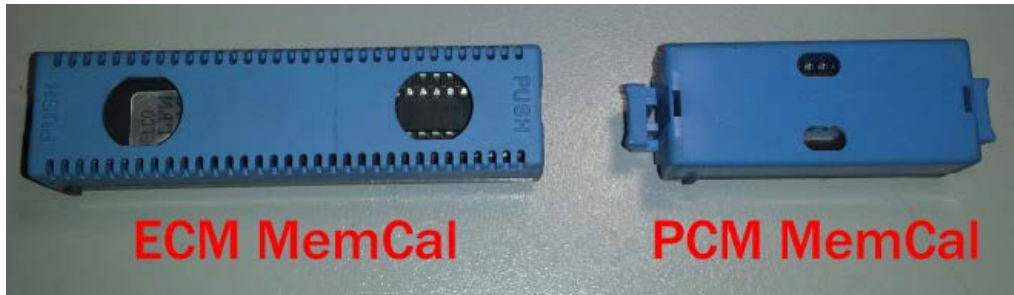
PC Software

Software	Notes	Link
Tunerpro RT V5.x	<p>This is not technically a PCMHACKING.net product. It is developed by Mark Mansur from tunerpro.net and can be downloaded from his site. We recommended purchasing a license from Mark to promote its future development.</p> <p>Make sure you get the RT version (Real Time) if you intend to use it for real time tuning.</p>	http://tunerpro.net/
OSEPlugin	This is PCMHACKING.net's plugin for Tuner Pro v5.x which handles the communication between TunerPro and our ECM/PCM operating systems. It is required for Real Time tuning, but not for stand alone logging.	http://pcmhacking.net/forums/viewtopic.php?f=3&t=590
Delco Flash Tool	This software is a great swiss army knife. It will allow you to download bins, and upload cals to our ECM/PCM operating systems. It can also be used for development, to listen to the vehicle data bus and to send custom commands. It is also used for utility functions such as converting a bin between an older and newer version of OSE12P, and editing a bin and ADX to define a new mode 6 calibration (fast logging of fewer parameters on OSE12P).	http://pcmhacking.net/forums/viewtopic.php?f=3&t=82
Bin ID tool	This is a great utility used to identify what operating system is contained in a bin file when it is unknown. It also advises you of which XDF and ADX to use, and provides you with all of them sorted in to car model.	http://pcmhacking.net/forums/viewtopic.php?f=3&t=905
Kinjflow Calculator	This software is actually a spreadsheet that can be used to convert known injector flow data and fuel pressure data to a injector flow rate that can be used in your tune after upgrading injectors.	http://pcmhacking.net/forums/viewtopic.php?f=3&t=334
LS1 Flash Tool	This tool can read LS1 tunes from the '0411 Delphi PCM and save them to bin. It works with the AVT 852 cable, which is not easily available. In the future it will be able to write as well. Currently it is for experimental purposes, and for LS1 tuning we recommend EFILive. There is no ETA, but you may want to subscribe to this thread.	http://pcmhacking.net/forums/viewtopic.php?f=3&t=3111

Please note all information contained herein is correct to the best of our knowledge. However it is possible there may be errors so it should be treated as a guide only. If you see any please report them in the [FAQ thread](#) on PCMHACKING.net so they can be corrected.

Factory ECM and PCM Memcals

ECM is short for 'Engine Control Module'. 'PCM is short for Powertrain Control Module' and refers to newer systems with electronic autos and programs which generally try consider torque delivered and the state of the whole drivetrain. MemCal is short for 'Memory/Calibration'. This is the chip that holds the program which runs on the computer (the operating system) and the calibration (tune).



The ECM MemCals are the 'long ones'. The PCM MemCals are the 'short ones'.

They are located inside the computers, either under access panels or under the end cap.

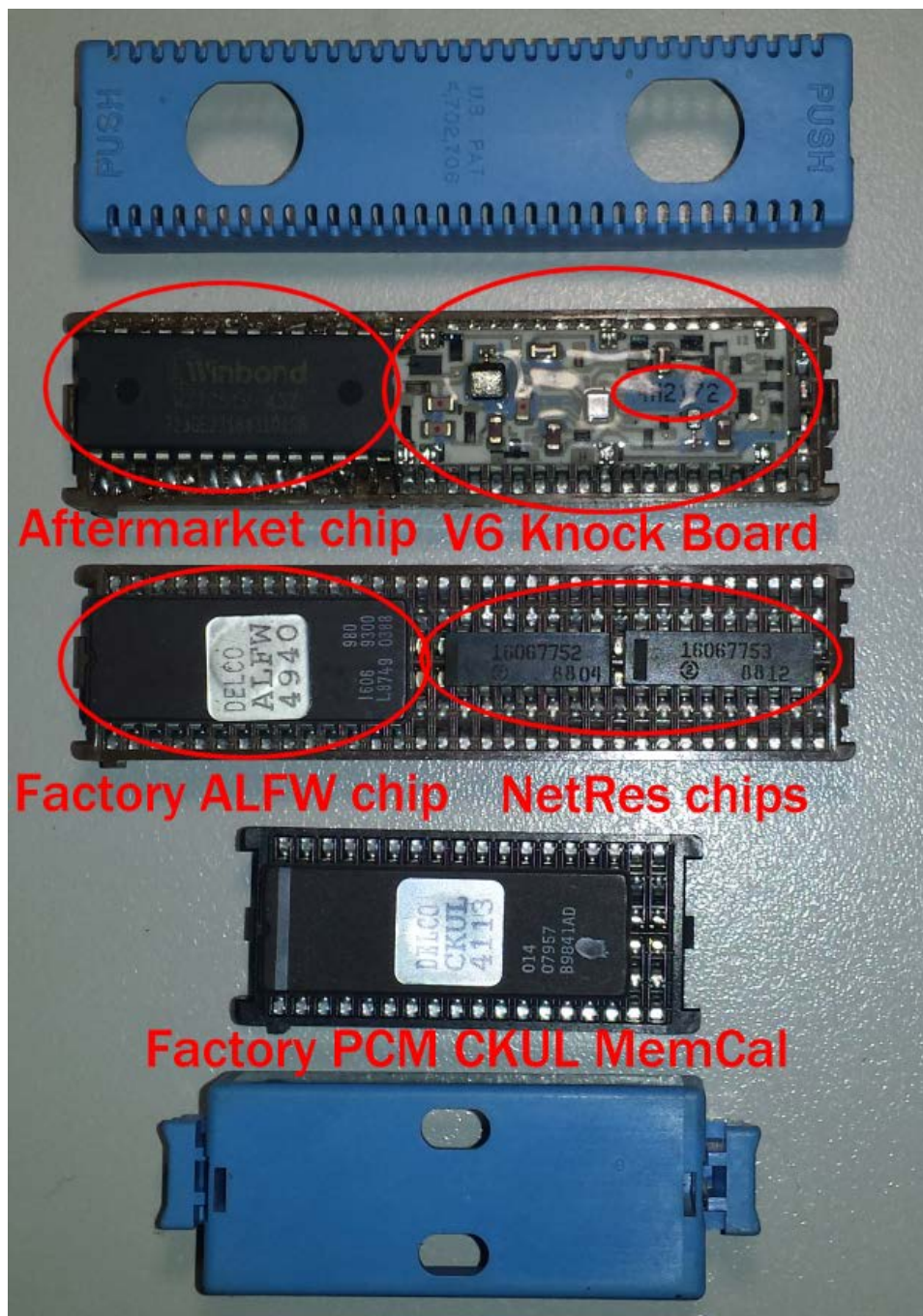
The PCM Memcals are reasonably straight forward. They just contain a chip which holds the operating system and the calibration.

The ECM Memcals contain 3 things.

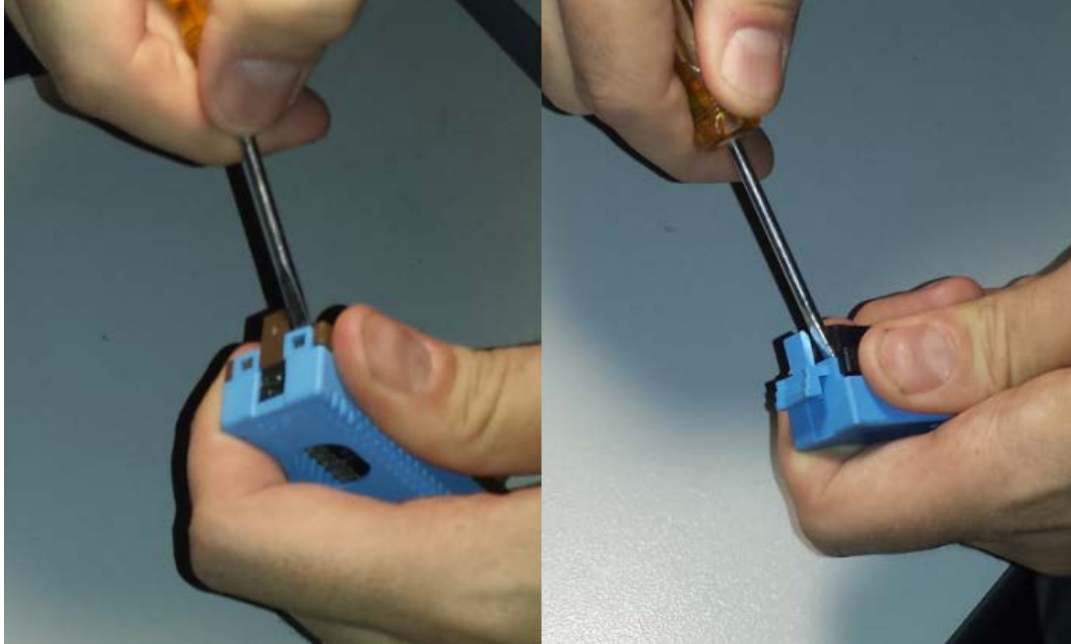
1. The first is the chip which contains the operating system and the calibration. The factory chips have a sticker on them with a 4 letter code (see the picture on the next page). This code tells you which factory tune is on the chip and therefor the original application. It is possible to remove this sticker and erase and reprogram the chip but for the most part people stick a new label on the chip if they reprogram it or replace the chip with something else entirely. Note that VN/VP factory tunes are 16kb (128kbit) and a 12P tune is 32kb (256kbit) and will not fit on a factory VN/VP Memcal without replacing and upgrading the chip.
2. The next is the NetRes which look like chips but are in fact a network of resistors (where they get their name). The values of these resistors signal to the computer how many cylinders the engine has, and provide values for backup fuelling should it be required. If they are not correct for the application you will observe massively incorrect fueling.
3. Some Memcals (V6, and HSV V8) provide a knock filter. The knock sensor itself is a piezo microphone and the knock filter is an audio filter which blocks out the background noise and listens for sound at the exact frequency of the engine knock. It then generates a signal the ECM can understand and interpret as levels of knock. These knock filters are tuned to the engine. There is a number printed on the top of them, and if that number starts with 1F.... you have a v8 knock board. If it starts with anything else it's a V6 board. These boards can not be swapped between V6 and V8. If you run a knock filter on your V8 make sure you have the correct one. There have been many reports of people installing V6 items in to V8s with less than desirable results. If you have a V8 and you do not have a V8 1F.... knock filter, you

should disable the knock sense or else about 9 degrees of timing will be continuously pulled from your tune.

Here some examples of Memcals. The first item is a V6 chip with an aftermarket chip/tune soldered in. The markings on the Knock board show 4H.... so it's a V6 knock filter. The next Memcal is a factory 4 cylinder Memcal ALFW. In Australia no 4 Cylinder application received a knock sensor so the knock filter is omitted and you can see the NetRes chips which are normally underneath the filter. The last memcal is a typical PCM Memcal. It's a CKUL which means it's a VS 3.8L Auto application, for the 1998 transmission. See this link for a list <http://pcmhacking.net/memcals.html>

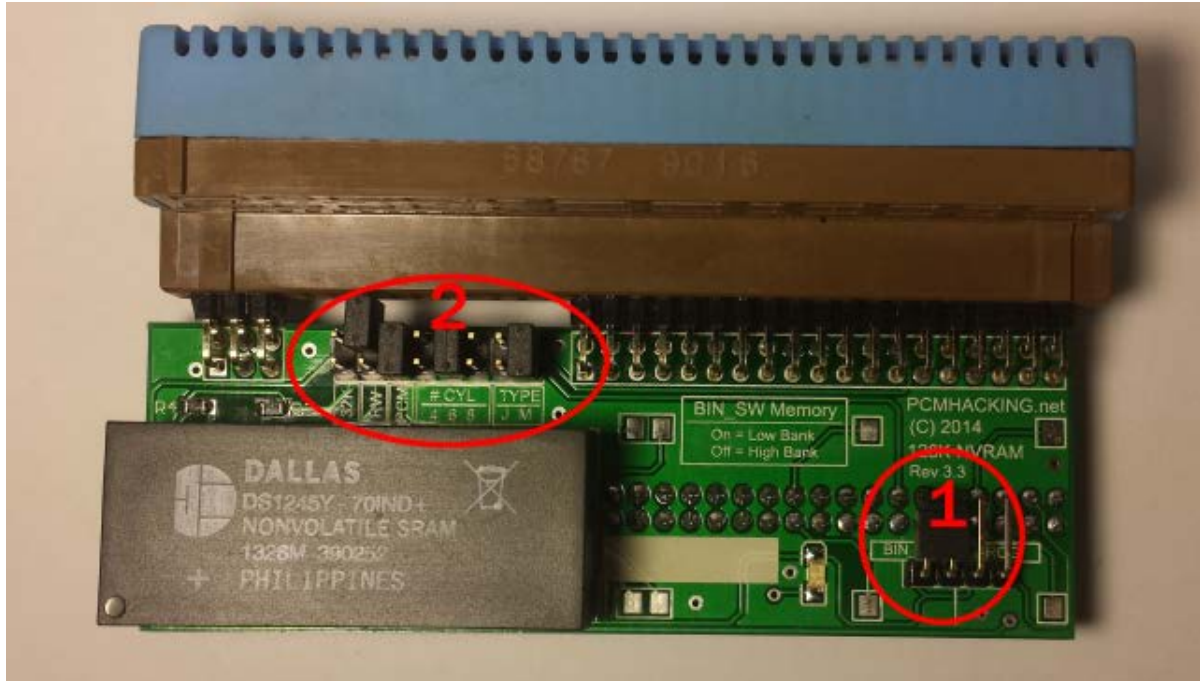


To open Memcals use a small flat head screwdriver and insert under the clips on the end of the memcal. For ECM Memcals you can use your thumb to catch the blue cover when the first clip lifts over its anchor and then you can go for the second. The PCM Memcals only have one clip on each end.



PCMhacking.NET Hardware

ECM NVRAM



This is a typical PCMhacking.net ECM NVRAM board. It contains a genuine Dallas NonVolatile sRAM chip. This chip is sourced through official supply chains and is superior in quality to the knockoffs often found via other common online marketplaces. It is also the industrially rated version which can survive the high automotive cabin temperatures often experienced in parked cars during the Australian summer.

This chip is split in to two 64kb halves, also known as banks. Jumpers are used to set the options on these boards, and the BIN SW jumper (1) is used to select if the ECM will see the upper or lower 64kb half. In practice you should not need to change this setting, but if it is required the option is there.

There are various options under the bank of jumpers labelled 2. The first is 32K. This is generally not needed, but can be set if you have a 32K NVRAM and wish to use it.

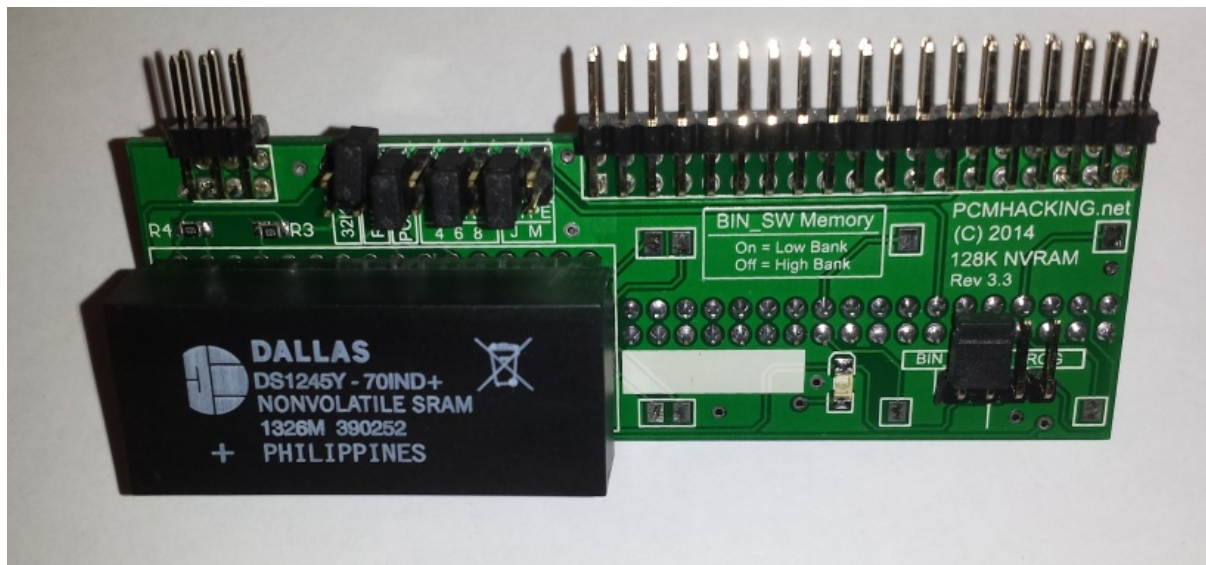
The next is RW. This means Read/Write. This is a safety feature as when it is not set (as shown above – the jumper is sitting on one pin only, and overhanging the top side of the board) the engine computer can not intentionally or accidentally write to the NVRAM. You should leave this jumper not set until the NVRAM is installed, you have comms to your PC and you are satisfied that everything is working properly. Now you can set this jumper. If you plug the NVRAM in to a powered up ECM with this jumper set, or knock the ECM circuit board in to the metal computer case while moving things around with this jumper set you can erase or damage the contents of the NVRAM requiring a reprogramming. This should be avoided.

The next jumper is PCM. This MUST be set when you use the NVRAM module in a '424 or other VR/VS auto computer (This includes VS V6 Manual). If this jumper is not set the car will run but you will experience random data corruption which will likely send you insane! For the most common applications – 12P in an '808 or a '165 this jumper should not be set.

The next setting defines the number of cylinders. Shown here the jumper is across 6 meaning 6 cylinder applications. This performs the function of the NetRes resistors in the stock Memcal but only when J is selected.

The last settings are J and M. This stands for Jumpers or Memcal. In this example a Memcal is connected across the top of the NVRAM module and M is selected. The Memcal hardware is used for cylinder selection and so is its knock filter.

Pictured below is how you might run the board for a non-HSV V8 application where there is no knock hardware fitted to the engine. J is set for Jumper fuel settings and 8 cylinder is selected. There is no knock filter required or present. The RW jumper is not yet set, as this will be set after the board has been tested in the car.



PCM NVRAM



This is a typical PCMHACKING.net PCM NVRAM board. It is similar to the ECM NVRAM, but there are differences. The late model cars do not have any settings for number of cylinders on the memcal, so you will not find those settings here. There is also no knock filter required, so there is no need to connect an original memcal.

The jumpers contain options for model. The two VT jumpers should be set for VT computers, OR the 2 VS jumpers should be set to operate on a VS. You should not set VS and VT at the same time – memory corruption will occur.

The RW jumper is not set when the device is shipped. It is sitting across 1 pin as shown above. You should check that it is present when unpacking the hardware. Sometimes they can fall off in post and may be loose in the bag. Once you are up and running you should set this jumper to enable realtime tuning.

P is for future use, and should not be set.