

MRMODULE.COM.AU

HOLDEN ALDL CONTROL MODULE SIMULATOR VR – VS – VT – VX – VY

This module is designed to simulate the data normally transmitted by factory modules on the ALDL data bus. It's often used as a BCM Simulator (usually as part of an engine conversion into another vehicle), but is also capable of working in several other configurations.

Features include:

- Complete VATS (Vehicle Anti-Theft System) emulation allowing the PCM to run without any modification, memcal reprogramming or re-flashing required. No requirement for the factory transponder key or factory BCM. No requirement to have the PCM linked with a scan tool.
- An optional external kill switch can be used to activate VATS, to prevent the engine running when the kill switch is on (assuming VATS has not otherwise been disabled via a PCM memcal re-program or re-flash).
- Low speed cooling fan output, when used with VS onwards PCM's. This is used to trigger the low-speed cooling fan as requested by the PCM when the engine reaches temperature or A/C is switched on.
- Warning lamp outputs when used with VT onwards PCM's (Either by actively acting as a BCM, or passively if a PCM and BCM are already used)
 - o Oil pressure warning lamp
 - o Engine Malfunction / MIL lamp
 - o Power/Econ shift pattern lamp (for auto trans applications)
- Instrument Cluster support (VT, VX or VY), by simulating the BCM requests to send data to the cluster. Allowing use of a factory instrument cluster together with the compatible PCM, typically in a conversion into another vehicle.
- PCM controlled Air-conditioning support, used by signalling a request to the PCM to engage the A/C Compressor Clutch.
(When used with VT onwards PCM's that have an AC Refrigerant Pressure sensor connected)
- Simulation of ABS/TC and SRS modules to prevent factory instrument clusters showing ABS/TC and SRS lights or warning chimes, when no ABS/TC or SRS module is present.
- Traction Control Torque Request PWM signal simulation, that can be connected to the PCM input to prevent a 'Requested Torque Out of Range' DTC.
- A low vehicle speed (< 5km/h) output when used with VT onwards PCM's, that can be used to trigger a manual transmission reverse-lockout solenoid (or for any other purpose).
- PCM data simulation, for when a standard BCM and Instrument Cluster are used and the factory PCM has been removed (IE. replaced with an aftermarket PCM), to prevent associated Instrument Cluster warning lights or chimes.
- Support for BCM 'Disable Chatter' commands, allowing scan tools or software such as TunerPro to work with the PCM as if it's still fitted in a factory vehicle.

INSTALLATION

Detailed instructions for specific applications are included in further sections. This is a general overview.

The simulator has 10 wires, only some of which will be used depending on your application. The only essential connections are **Ignition Power, Earth and ALDL data**.

The remaining 7 optional connections consist of 5 low-side switching outputs (switching to ground), 1 high-side (supply 12v) input, and 1 low-side (supply earth) input. Their use and purpose will depend on how the simulator is configured.

Each wire and its functions are listed in the following table.

WIRE	DESCRIPTION	PURPOSE / CONNECTION
Black	Earth	Simulator earth, typically connected to same wire as PCM Earth
Pink	Ignition +12v	Supply voltage to simulator, typically connected to same wire as PCM Ignition +12v
Red + Black	ALDL Data	Data connection to PCM, Instrument Cluster or other modules
White + Red	High Input	Activated when voltage is applied. A/C REQUEST INPUT (configured as a VT - VY BCM Simulator) OIL LAMP REQUEST (configured as a PCM Simulator)
White + Black	Low Input	Activated when connected to earth. DISABLE VATS (configured as a BCM Simulator) MIL LAMP REQUEST (configured as a PCM Simulator)
Blue	Output 1	OIL PRESSURE LAMP A/C REQUEST (configured as a PCM Simulator)
Brown	Output 2	ENGINE MALFUNCTION / MIL LAMP
Green	Output 3	LOW SPEED FAN CONTROL
Yellow	Output 4	POWER SHIFT INDICATOR LAMP (Auto Trans)
Violet	Output 5	LOW VEHICLE SPEED / REVERSE LOCKOUT ABS/TC TORQUE REQUEST PWM SIGNAL (when configured)

The high side input can be controlled directly by 12v. A minimum of 8-9 volts is required to trigger it.

The low side input must be connected to less than 0.8v relative to the simulator earth to be triggered. If controlled by another device, it must be capable of receiving up to 5v on its output, and will be required to sink up to a maximum of 5mA of current.

Each output is rated to 0.7A, and has integrated overload and short circuit, over voltage and thermal protection. They are suited to driving an automotive relay, or a warning light up to 5w.

CONFIGURATION

The simulator has several different “Modes” it can be configured to operate in, that will define its basic behaviour, how it operates and what it will do. Some of these modes also include further options.

Configuration is performed by opening the plastic case and adjusting a series of small switches on the PCB. There are 4 small Phillip’s head screws holding the rear cover with the mounting tabs on to the rest of the case. The switches are numbered 1 to 8.

Switches 1 to 4 define the operating mode.

Switches 5 to 7 are further options for the selected operating mode.

Switches are ON when they are pushed closer to the centre of the simulator (the side that says ON), and OFF when towards the outside edge of the simulator (the side with the numbers on it).



Switch number 8 enables an onboard debug LED that can be used for trouble shooting. When in mode 0 it will flash once a second. When in any other mode it will flash as data is transmitted or received on the ALDL data bus, unless otherwise noted.

The switches must be selected before the simulator is powered on. Changing switches once it is powered up will have no effect until the next ignition cycle.



The simulator comes pre-configured in “Mode 1” to automatically detect and act as a VR-VS or VT-VY BCM Simulator, depending on what type of PCM it finds connected. This provides all the above-mentioned inputs and outputs, as well as providing support for VATS, A/C and Instrument Clusters (Including ABS/TC and SRS simulation to prevent instrument cluster warnings).

It is recommended to read though the following pages that describe in detail all the different modes and options, so you can be sure the simulator is correctly configured to your requirements.



MODE 0 DEBUG MODE

MODE SWITCHES		DESCRIPTION
		<p>This is the default mode when no switches, or an invalid combination of switches 1 to 4 are selected.</p> <p>With switch #8 turned on, the internal LED should blink on and off once every second. This confirms the simulator is powered up.</p> <p>The simulator will otherwise not do anything, and no inputs or outputs will function.</p>
OPTIONAL SWITCHES		
		
INPUT DESCRIPTIONS		
Switch 5	N/A	
Switch 6	N/A	
Switch 7	N/A	
White + Red Wire (High Input)	N/A	
White + Black Wire (Low Input)	N/A	
OUTPUT DESCRIPTIONS		
1 - Blue	N/A	
2 - Brown	N/A	
3 - Green	N/A	
4 - Yellow	N/A	
5 - Violet	N/A	



MODE 1 AUTO-DETECT BCM SIMULATOR

MODE SWITCHES	DESCRIPTION
 <p>1 <input type="checkbox"/> ON 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/></p>	<p>This is the standard mode that the simulator will be pre-configured when you receive it.</p> <p>When the ignition is switched on, it will quickly determine what model of PCM is connected (VR-VS or VT-VY) and automatically change the operating mode to the suitable BCM simulator mode for the PCM type (Mode 2 for VR-VS or Mode 3 for VT-VY).</p>
<p>OPTIONAL SWITCHES</p>  <p>5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> DIP</p>	<p>See the Mode 2 or Mode 3 descriptions depending on PCM type.</p>
INPUT DESCRIPTIONS	
<p>Switch 5</p>	<p>Disable VATS See mode 2 or 3 depending on PCM type. Equivalent to White + Black Wire disable VATS input. Having this switched on will skip trying to resolve VATS for the PCM. Use only if VATS is already disabled in the PCM or the engine will not start. Can also be used if you want to prevent re-linking of a VT-VY PCM.</p>
<p>Switch 6</p>	<p>See mode 2 or 3 depending on PCM type.</p>
<p>Switch 7</p>	<p>See mode 2 or 3 depending on PCM type.</p>
<p>White + Red Wire (High Input)</p>	<p>N/A for VR or VS. See mode 3 if using VT to VY PCM</p>
<p>White + Black Wire (Low Input)</p>	<p>Disable VATS Connecting this to ground will skip trying to resolve VATS for the PCM. It can be connected to a simple kill-switch. When the switch is on, the engine will not start (assuming VATS has not been disabled in the PCM).</p>
OUTPUT DESCRIPTIONS	
<p>1 - Blue</p>	<p>N/A</p>
<p>2 - Brown</p>	<p>N/A</p>
<p>3 - Green</p>	<p>N/A</p>
<p>4 - Yellow</p>	<p>N/A</p>
<p>5 - Violet</p>	<p>N/A</p>

MODE 2 VR - VS BCM SIMULATOR

MODE SWITCHES	DESCRIPTION
	<p>This mode will simulate both VR and VS VATS responses to the PCM. Either 'OK' or 'NOT OK' to start responses will be sent depending on the Disable VATS inputs (see below).</p> <p>The Low Speed Cooling Fan output will be switched to drive a relay as requested by the PCM, and an acknowledgement response will be sent back to the PCM.</p> <p>With Switch 6 and 7 inputs active, the simulator will not send anything, so can be used to control a low-speed fan even with a factory VS BCM connected.</p>
OPTIONAL SWITCHES	
	
INPUT DESCRIPTIONS	
Switch 5	<p>Disable VATS Equivalent to White + Black Wire disable VATS input. Having this switched on will cause a 'no-go' response every time the PCM requests the BCM for VATS status. Use only if VATS is already disabled in the PCM or the engine will not start.</p>
Switch 6	<p>Ignore VATS Ignore and don't respond whenever the PCM requests the BCM for VATS status. Use only if VATS is already disabled in the PCM or the engine will not start.</p>
Switch 7	<p>Skip Low Speed Fan Response Don't send a response to the PCM whenever it requests the low-speed fan to be switched, but still activate the low-speed fan output as requested. This may cause the PCM to store a DTC.</p>
White + Red Wire (High Input)	N/A
White + Black Wire (Low Input)	<p>Disable VATS Connecting this to ground will skip trying to resolve VATS for the PCM. It can be connected to a simple kill-switch. When the switch is on, the engine will not start (assuming VATS has not been disabled in the PCM).</p>
OUTPUT DESCRIPTIONS	
1 - Blue	N/A
2 - Brown	N/A
3 - Green	<p>Low Speed Cooling Fan Connect to pin 85 of the relay used to switch the low-speed engine cooling fan. See wiring pages for further details.</p>
4 - Yellow	N/A
5 - Violet	N/A

MODE 3 VT - VY BCM SIMULATOR



MODE SWITCHES	DESCRIPTION
	<p>This mode will resolve VATS for VT, VX and VY PCM's. Since the PCM normally requires a BCM to be 'linked', the simulator will link itself to the PCM if the PCM doesn't initially accept its unique code. Either 'OK' or 'NOT OK' to start messages will be sent depending on the Disable VATS inputs (see below).</p>
OPTIONAL SWITCHES	
	<p>Once VATS is resolved, the simulator will act like a standard BCM to request data from every other module periodically. This data is received and used by other modules. The most common use for this is requesting data from the PCM that is used by the instrument cluster.</p> <p>The 5 outputs will be controlled depending on the data received from the PCM (see below).</p> <p>ABS/TC and SRS data will be simulated to prevent instrument cluster warnings. This can be disabled using Switch 6.</p> <p>Output 5 can be used as an ABS/TC Torque Request PWM signal for the PCM, if the simulated ABS/TC data causes the PCM to log a 'Requested Torque Out of Range' DTC.</p> <p>Normal BCM 'disable chatter' commands will work with this simulator, allowing the use of scan tools and other software with the PCM.</p>
INPUT DESCRIPTIONS	
Switch 5	<p>Disable VATS Equivalent to White + Black Wire disable VATS input. Having this switched on will cause a 'no-go' VATS message to the PCM. It will also prevent the simulator 'linking' to the PCM. Use only if VATS is already disabled in the PCM or the engine will not start.</p>
Switch 6	<p>Don't include ABS/TC and SRS data This will prevent the simulation of ABS/TC and SRS data, normally used to prevent warning lights on the instrument cluster. If you're not using a factory instrument cluster you won't need that data. You will also want to turn this on if there's a real ABS/TC or SRS module connected.</p>
Switch 7	<p>ABS/TC Torque Request on Output 5 With this turned-on, Output 5 will be repurposed to output an ABS/TC Torque Request PWM signal. This can be connected to the PCM. See output description below.</p>
White + Red Wire (High Input)	<p>AC Request This is used to signal the PCM to turn the A/C Compressor clutch on. See wiring pages for further details.</p>
White + Black Wire (Low Input)	<p>Disable VATS Connecting this to ground will skip trying to resolve VATS for the PCM. It can be connected to a simple kill-switch. When the switch is on, the engine will not start (assuming VATS has not been disabled in the PCM).</p>
<p>Continued over page...</p>	

OUTPUT DESCRIPTIONS	
1 - Blue	Oil Pressure Warning Lamp
2 - Brown	Engine Malfunction / MIL Lamp
3 - Green	<p>Low Speed Cooling Fan Connect to pin 85 of the relay used to switch the low-speed engine cooling fan. See wiring pages for further details.</p>
4 - Yellow	<p>Power / Econ Shift Pattern Lamp Auto trans applications. See wiring pages for further details.</p>
5 - Violet	<p>Low Vehicle Speed or ABS/TC Torque Request Depending on the selection of Switch 7. The Low Vehicle Speed output is active and will switch to ground whenever the PCM data shows vehicle speed is below 5 km/h. This can be used to control a relay to operate a reverse lockout solenoid. The ABS/TC Torque Request output is a PWM signal for the PCM. Connect to PCM pin C11 (VT), or B8 (VX, VY). It prevents the PCM storing a 'Requested Torque Out of Range' DTC if Switch 6 is off and ABS/TC data is being simulated.</p>



MODE 4 VT - VY PCM OUTPUT INTERFACE

MODE SWITCHES	DESCRIPTION
	<p>This mode provides the same 5 outputs as mode 3, but requires both an existing PCM and BCM to be already connected.</p> <p>ABS/TC and SRS data will be simulated to prevent instrument cluster warnings. If there is already ABS/TC or SRS modules connected, these can be disabled using Switch 5 and 6.</p>
OPTIONAL SWITCHES	
	<p>Output 5 can be used as an ABS/TC Torque Request PWM signal for the PCM, if the simulated ABS/TC data causes the PCM to log a 'Requested Torque Out of Range' DTC.</p>
INPUT DESCRIPTIONS	
Switch 5	<p>Don't include ABS/TC data</p> <p>This will prevent the simulation of ABS/TC data, normally used to prevent warning lights on the instrument cluster. If you're not using a factory instrument cluster you won't need that data. You will also want to turn this on if there's a real ABS/TC module connected.</p>
Switch 6	<p>Don't include SRS data</p> <p>This will prevent the simulation of SRS data, normally used to prevent warning lights on the instrument cluster. If you're not using a factory instrument cluster you won't need that data. You will also want to turn this on if there's a real SRS module connected.</p>
Switch 7	<p>ABS/TC Torque Request on Output 5</p> <p>With this turned-on, Output 5 will be repurposed to output an ABS/TC Torque Request PWM signal. This can be connected to the PCM. See output description below.</p>
White + Red Wire (High Input)	N/A
White + Black Wire (Low Input)	N/A
OUTPUT DESCRIPTIONS	
1 - Blue	Oil Pressure Warning Lamp
2 - Brown	Engine Malfunction / MIL Lamp
3 - Green	<p>Low Speed Cooling Fan</p> <p>Connect to pin 85 of the relay used to switch the low-speed engine cooling fan. See wiring pages for further details.</p>
4 - Yellow	<p>Power / Econ Shift Pattern Lamp</p> <p>Auto trans applications. See wiring pages for further details.</p>
5 - Violet	<p>Low Vehicle Speed or ABS/TC Torque Request</p> <p>Depending on the selection of Switch 7.</p> <p>The Low Vehicle Speed output is active and will switch to ground whenever the PCM data shows vehicle speed is below 5 km/h.</p> <p>This can be used to control a relay to operate a reverse lockout solenoid.</p> <p>The ABS/TC Torque Request output is a PWM signal for the PCM. Connect to PCM pin C11 (VT), or B8 (VX, VY).</p> <p>It prevents the PCM storing a 'Requested Torque Out of Range' DTC if Switch 6 is off and ABS/TC data is being simulated.</p>



MODE 5 VT - VY PCM SIMULATOR

MODE SWITCHES	DESCRIPTION
	<p>This mode is for use when a standard BCM and Instrument Cluster are used, but the PCM has been removed (possibly replaced by an aftermarket PCM). Its purpose is to prevent warning lights and chimes on the instrument cluster.</p> <p>The BCM type fitted in the vehicle must be configured using Switch 5. Normally the PCM data simulated will match the BCM type, however Switch 6 and 7 can be used to force a different PCM data type if required. By doing this you can use the associated Instrument Cluster, regardless of the BCM type (For example a VY Instrument Cluster with a VT BCM).</p> <p>The Engine Malfunction / MIL and Oil Warning Instrument Cluster warnings can be activated using the 2 input wires (possibly used to trigger the warnings from an aftermarket PCM, or a standard on/off oil pressure switch).</p> <p>Output 1 will be triggered when the BCM or Climate Control is requesting the PCM to have the A/C Compressor Clutch engaged.</p> <p>Output 2 will be triggered when the BCM is broadcasting its VATS code to the PCM, indicating the ignition key has been successfully read.</p>
OPTIONAL SWITCHES 	
INPUT DESCRIPTIONS	
Switch 5	BCM Type Off if there is a VT or VX BCM On if there is a VY BCM
Switch 6	Force VT / VX PCM Data This will force the PCM data be of VT / VX format, to suit a VT / VX Instrument Cluster.
Switch 7	Force VY PCM Data This will force the PCM data be of VY format, to suit a VY Instrument Cluster.
White + Red Wire (High Input)	Request Oil Pressure Warning
White + Black Wire (Low Input)	Request Engine Malfunction / MIL Warning
OUTPUT DESCRIPTIONS	
1 - Blue	A/C Request Signal from BCM This will be active (pulled to ground) whenever the BCM is requesting the PCM to engage the A/C Compressor clutch. You can use it to activate the A/C clutch relay, but a pressure switch should be fitted in series.
2 - Brown	BCM side VATS complete This will be active (pulled to ground) whenever the BCM has successfully read a valid + programmed ignition key, and is attempting to send the link code to the PCM to allow the engine to start
3 - Green	N/A
4 - Yellow	N/A
5 - Violet	N/A



MODE 6 BCM BENCH SIMULATOR

MODE SWITCHES	DESCRIPTION
	<p>This mode is intended for VT – VY bench testing and programming applications that normally require the BCM to operate properly. The module will request data from other modules periodically as if a real BCM was connected.</p> <p>The BCM/vehicle type must be configured using Switch 5.</p>
OPTIONAL SWITCHES	
	<p>If a PCM is also connected, the 5 outputs and high input will operate the same as mode 3 (VT – VY BCM Simulator)</p>
INPUT DESCRIPTIONS	
Switch 5	BCM Type Off for a VT or VX BCM On for a VY BCM
Switch 6	N/A
Switch 7	N/A
White + Red Wire (High Input)	AC Request Only with PCM connected, see mode 3
White + Black Wire (Low Input)	N/A
OUTPUT DESCRIPTIONS	
1 - Blue	Oil Pressure Warning Lamp Only with PCM connected, see mode 3
2 - Brown	Engine Malfunction / MIL Lamp Only with PCM connected, see mode 3
3 - Green	Low Speed Cooling Fan Only with PCM connected, see mode 3
4 - Yellow	Power / Econ Shift Pattern Lamp Only with PCM connected, see mode 3
5 - Violet	Low Vehicle Speed Only with PCM connected, see mode 3

MODE 7 VT/VX MISSING MODULE SUPPORT

MODE SWITCHES	DESCRIPTION
	<p>This mode is for use when a standard BCM and Instrument Cluster are used - but the PCM, ABS and/or SRS modules have been removed. Its purpose is to retain basic functionality and prevent warning lights and chimes on the instrument cluster. It provides similar functionality to mode 5, but is VT/VX specific and allows removal of ABS and SRS modules as well.</p>
OPTIONAL SWITCHES 	<p>A VT/VX Instrument cluster must be used. The modules that are missing must be configured using switches 5 to 7.</p> <p>When the PCM has been removed, the Engine Malfunction / MIL and Oil Warning Instrument Cluster warnings can be activated using the 2 input wires (possibly used to trigger the warnings from an aftermarket PCM, or a standard on/off oil pressure switch).</p> <p>Output 1 will be triggered when the BCM or Climate Control is requesting the PCM to have the A/C Compressor Clutch engaged.</p> <p>Output 2 will be triggered when the BCM is broadcasting its VATS code to the PCM, indicating the ignition key has been successfully read.</p>
INPUT DESCRIPTIONS	
Switch 5	Retain Factory ABS/TC Off if ABS/TC module has been removed On if factory ABS/TC module is still present
Switch 6	Retain Factory SRS Off if SRS module has been removed On if factory SRS module is still present
Switch 7	Retain Factory PCM Off if PCM has been removed On if factory PCM is still present
White + Red Wire (High Input)	Request Oil Pressure Warning
White + Black Wire (Low Input)	Request Engine Malfunction / MIL Warning
OUTPUT DESCRIPTIONS	
1 - Blue	A/C Request Signal from BCM This will be active (pulled to ground) whenever the BCM is requesting the PCM to engage the A/C Compressor clutch. You can use it to activate the A/C clutch relay, but a pressure switch should be fitted in series.
2 - Brown	BCM side VATS complete This will be active (pulled to ground) whenever the BCM has successfully read a valid + programmed ignition key, and is attempting to send the link code to the PCM to allow the engine to start
3 - Green	N/A
4 - Yellow	N/A
5 - Violet	N/A

MODE 8 VY MISSING MODULE SUPPORT

MODE SWITCHES	DESCRIPTION
	<p>This mode is for use when a standard BCM and Instrument Cluster are used - but the PCM, ABS and/or SRS modules have been removed. Its purpose is to retain basic functionality and prevent warning lights and chimes on the instrument cluster. It provides similar functionality to mode 5, but is VY specific and allows removal of ABS and SRS modules as well.</p>
OPTIONAL SWITCHES 	<p>A VY Instrument cluster must be used. The modules that are missing must be configured using switches 5 to 7.</p> <p>When the PCM has been removed, the Engine Malfunction / MIL and Oil Warning Instrument Cluster warnings can be activated using the 2 input wires (possibly used to trigger the warnings from an aftermarket PCM, or a standard on/off oil pressure switch).</p> <p>Output 1 will be triggered when the BCM or Climate Control is requesting the PCM to have the A/C Compressor Clutch engaged.</p> <p>Output 2 will be triggered when the BCM is broadcasting its VATS code to the PCM, indicating the ignition key has been successfully read.</p>
INPUT DESCRIPTIONS	
Switch 5	Retain Factory ABS/TC Off if ABS/TC module has been removed On if factory ABS/TC module is still present
Switch 6	Retain Factory SRS Off if SRS module has been removed On if factory SRS module is still present
Switch 7	Retain Factory PCM Off if PCM has been removed On if factory PCM is still present
White + Red Wire (High Input)	Request Oil Pressure Warning
White + Black Wire (Low Input)	Request Engine Malfunction / MIL Warning
OUTPUT DESCRIPTIONS	
1 - Blue	A/C Request Signal from BCM This will be active (pulled to ground) whenever the BCM is requesting the PCM to engage the A/C Compressor clutch. You can use it to activate the A/C clutch relay, but a pressure switch should be fitted in series.
2 - Brown	BCM side VATS complete This will be active (pulled to ground) whenever the BCM has successfully read a valid + programmed ignition key, and is attempting to send the link code to the PCM to allow the engine to start
3 - Green	N/A
4 - Yellow	N/A
5 - Violet	N/A

WIRING

Earth, Ignition +12v and ALDL Data

These connections can all be made easily near the PCM. Below is a table identifying the PCM terminals, depending on PCM type, with the wires that the simulator should be spliced into for correct connection. Its important not to cut or disconnect the wires, leave the PCM connected to them, but the simulator can be spliced into those wires.

The PCM will have a single **24 pin**, and either 1x or 2x **32 pin** connector. They are labelled with letters and numbers on the rear side (where the wires come out). Terminals starting with A or B are always in the 24 pin connector. Terminals starting with C, D, E or F are in a 32 pin connector. When there is multiple 32 pin connectors, they will be a different colour. The pin numbers and associated connector colour are listed below.

PCM Service Number	Applications	Earth	Ignition +12v	ALDL Data
16183082	VR Manual – V6 + V8	A12	A6	A8
16206305	VS I + II Manual – V8	Black or L/Blue	Black or L/Blue	Black or L/Blue
16176424	VR Auto – V6 + V8	C2 or C3	C1	C11
16195699	VS I + II Auto – V8	Black or L/Blue	Black or L/Blue	Black or L/Blue
16199728	VS V6 – Auto + Manual	A1 or A2	A4	A3
16210672	VS V6 – Supercharged	Pink	Pink	Pink
16208257	VS V6			
16210480	VS V6 – Supercharged			
16234531	VS III + VT 5.0L V8 – Auto + Manual			
16233396	VT V6 – Auto + Manual			
09356445	VX + VY V6 – Auto + Manual	C6 or D6 Dark Brown	D16 Dark Brown	C13 Dark Brown

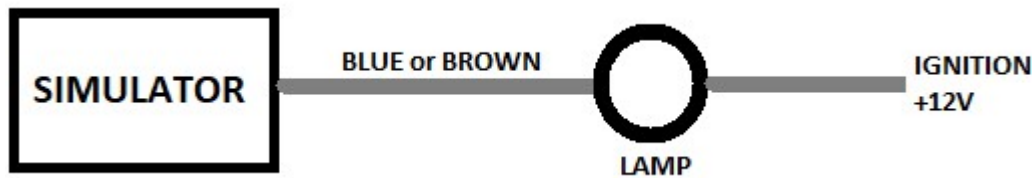
VATS Kill Switch

When operating as a BCM simulator (Modes 1, 2 or 3), and the PCM does not have VATS disabled via a memcal reprogram or re-flash, its possible to use a basic kill switch to prevent the engine from starting. The switch must remain on immediately from ignition on. As soon as the switch is turned off, the simulator will signal the PCM that it's 'ok to start'. Due to the way VATS works, it's not possible to shut the engine down again until the next ignition cycle.



Oil Pressure + Engine Malfunction (MIL) Warning Lamps

When using a VT, VX or VY PCM in modes 3 or 4, warning lamps can be connected as shown. The lamps should be 5 watt maximum.



Power / Econ Shift Pattern Indicator Lamp

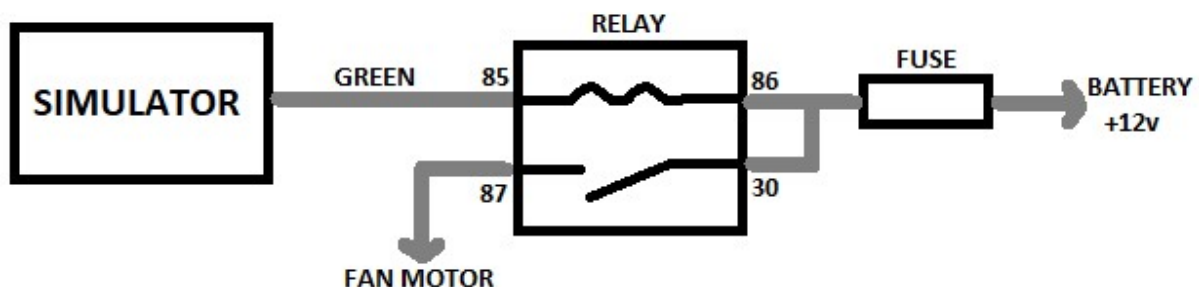
When using an Automatic VT, VX or VY PCM in modes 3 or 4, the Power/Econ shift pattern indicator can be used. The PCM will need a momentary push button input connected to the relevant pin to toggle the shift pattern.

Wiring the same as the Oil and Engine Malfunction lamps will result in a single lamp that comes on in the Power position.

If you would prefer 2 lamps (Power and Econ), the yellow wire output from the simulator can be connected to pin 85 of a change over relay. Pin 86 should be supplied with ignition voltage. Pin 30 of the relay will be connected to 87 when in the power position, and 87A when in the economy position. The relay can either switch the positive or negative side of the lamps, depending on their connection and the connection of relay pin 30.

Low Speed Engine Cooling Fan

When using a VS onwards PCM, and the simulator is in modes 1 to 4, the low-speed cooling fan can be controlled as requested by the PCM. Due to the high current draw of an electric fan motor, the simulator must switch a relay which is in turn used to power the fan. An example diagram is shown below.



A few notes:

- The high-speed fan relay is switched directly by the PCM
- VR Models did not use a low-speed fan
- V8 Models used a mechanical fan. They may not control the fan without memcal recalibration.

PCM Controlled A/C Compressor Clutch

VT, VX and VY PCM's are capable of controlling a relay to power the A/C Compressor clutch. The advantage of this is the PCM can disengage the A/C under certain conditions, such as high RPM or engine load or high coolant temperature.

For this to work the PCM and A/C Compressor need to be wired to an A/C Clutch Relay the same as factory. The PCM also needs the factory 3-wire refrigerant pressure sensor connected. The simulator needs to be in mode 1 or 3.

The white + red simulator A/C Request input wire should receive +12v when the interior fan is on and the A/C dash switch is on. It will signal the PCM to switch on the A/C Clutch Relay.

VT, VX, VY Instrument Clusters

With the simulator in mode 1 or 3, and using a VT to VY PCM, it makes it possible to also use a complete VT to VY instrument cluster.

The simulator will signal the PCM to transmit some data to the cluster. This data consists of Engine Malfunction and Oil Pressure warning lamp status, coolant temperature for the coolant gauge, and fuel consumption details. From factory the instrument cluster has physical vehicle speed and tacho signal input wires which will need to be connected.

The simulator will also simulate ABS/TC and SRS data to prevent these warnings on the cluster. This feature can be turned off (see mode description above).

The instrument cluster needs to be compatible with the PCM:

- VT and VX instrument clusters will work with VT and VX PCM's
- VY instrument clusters must be used with a VY PCM.

The ALDL Data wire of the cluster will be green and white (instead of red and black), this is because the factory BCM has 2 separate ALDL wires and isolates other modules from the PCM.

This green/white wire should be connected straight to the red/black wire running to the simulator and PCM.