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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)
  - Oil pressure warning lamp
  - Engine Malfunction / MIL lamp
  - 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 or LS1 PIM, 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

The simulator has 10 connections, only some of which will be used depending on your application. The only essential connections are **3. ALDL data, 4. Ignition Power** and **5. Earth**.
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 output is rated to 0.7A, and has integrated overload, short circuit, over voltage and thermal protection. They are suited to driving an automotive relay coil, or a warning light up to 5w.

Below is a back-probe view of the wiring connector, IE. Looking into the simulator.
Pin numbering may also be printed onto the back side (wire entry side) of the connector housing.

Connector Used: Molex Mini-Fit Jr. 10-way (4.2mm pitch) - Part #: 5557-10R / 39012100

10 - BLUE	**9 - BROWN**	**8 - GREEN**	**7 - YELLOW**	**6 - VIOLET**
Output 1	Output 2	Output 3	Output 4	Output 5
5 - BLACK	**4 - PINK**	**3 - RED**	**2 - GREY**	**1 - WHITE**
Earth	Ignition +12v	ALDL Data	Low Input	High Input

PIN	WIRE	DESCRIPTION	PURPOSE / CONNECTION
10	Blue	Output 1	**OIL PRESSURE LAMP** or **A/C REQUEST**
9	Brown	Output 2	**ENGINE MALFUNCTION / MIL LAMP**
8	Green	Output 3	**LOW SPEED FAN CONTROL**
7	Yellow	Output 4	**POWER SHIFT INDICATOR LAMP**
6	Violet	Output 5	**LOW VEHICLE SPEED, REVERSE LOCKOUT** or **ABS/TC TORQUE REQUEST PWM SIGNAL**
5	Black	**Earth**	Connected to same wire as ECU / PCM Earth
4	Pink	**Ignition +12v**	Supply voltage to simulator, typically connected to same wire as ECU / PCM Ignition +12v
3	Red	**ALDL Data**	Data connection to PCM, Instrument Cluster etc.
2	Grey	Low Input	**DISABLE VATS** or **MIL LAMP REQUEST** Activated when connected to earth (or below 0.8v). Uses a 5v pullup. Can source a maximum 5mA current.
1	White	High Input	**A/C REQUEST INPUT** or **OIL LAMP REQUEST** Activated when connected to 12v (or above 9v).

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 Phillips 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).

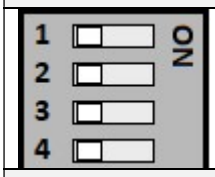
Switch number 8 enables an onboard debug LED that can be used for trouble shooting. When in mode 0 it will flash once a second to confirm power is connected. When in any other mode it will flash as data is transmitted or received on the ALDL data bus, unless otherwise noted.

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.

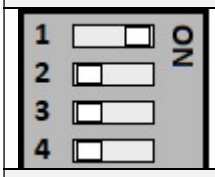
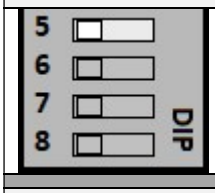
MODE 0 DEBUG MODE

MODE SWITCHES	DESCRIPTION
	This is the default mode when no switches, or an invalid combination of switches 1 to 4 are selected. With switch #8 turned on, the internal LED should blink on and off once every second. This confirms the simulator is powered up. The simulator will otherwise not do anything, and no inputs or outputs will function.
OPTIONAL SWITCHES	
	

INPUT DESCRIPTIONS	
Switch 5	N/A
Switch 6	N/A
Switch 7	N/A
High Input (Pin 1 - White wire)	N/A
Low Input (Pin 2 - Grey wire)	N/A

OUTPUT DESCRIPTIONS	
1 - Blue	N/A
2 - Brown	N/A
3 - Green	N/A
4 - Yellow	N/A
5 - Violet	N/A

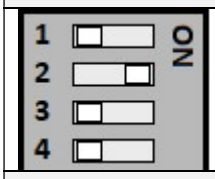
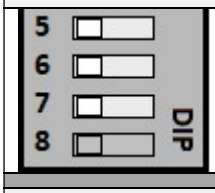
MODE 1 AUTO-DETECT BCM SIMULATOR

MODE SWITCHES	DESCRIPTION
	This is the standard mode that the simulator will be pre-configured when you receive it. 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). See the Mode 2 or Mode 3 descriptions depending on PCM type.
OPTIONAL SWITCHES	
	

INPUT DESCRIPTIONS	
Switch 5	**Disable VATS** See mode 2 or 3 depending on PCM type. Equivalent to the **Low Input** disable VATS. 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.
Switch 6	See mode 2 or 3 depending on PCM type.
Switch 7	See mode 2 or 3 depending on PCM type.
High Input (Pin 1 - White wire)	N/A for VR or VS. See mode 3 if using VT to VY PCM
Low Input (Pin 2 - Grey wire)	**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).

OUTPUT DESCRIPTIONS	
1 - Blue	N/A
2 - Brown	N/A
3 - Green	N/A
4 - Yellow	N/A
5 - Violet	N/A

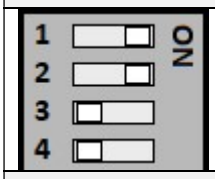
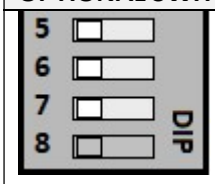
MODE 2 VR - VS BCM SIMULATOR

MODE SWITCHES	DESCRIPTION
	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). 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. 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.
OPTIONAL SWITCHES	
	

INPUT DESCRIPTIONS	
Switch 5	**Disable VATS** Equivalent to the **Low Input** disable VATS. 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.
Switch 6	**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.
Switch 7	**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.
High Input (Pin 1 - White wire)	N/A
Low Input (Pin 2 - Grey wire)	**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).

OUTPUT DESCRIPTIONS	
1 - Blue	N/A
2 - Brown	N/A
3 - Green	**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.
4 - Yellow	N/A
5 - Violet	N/A

MODE 3 VT - VY BCM SIMULATOR

MODE SWITCHES	DESCRIPTION
	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). 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. The 5 outputs will be controlled depending on the data received from the PCM (see below). ABS/TC and SRS data will be simulated to prevent instrument cluster warnings. This can be disabled using Switch 6. 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. Normal BCM 'disable chatter' commands will work with this simulator, allowing the use of scan tools and other software with the PCM.
OPTIONAL SWITCHES	
	

INPUT DESCRIPTIONS	
Switch 5	**Disable VATS** Equivalent to the **Low Input** disable VATS. 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.
Switch 6	**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.
Switch 7	**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.
High Input (Pin 1 - White wire)	**AC Request** This is used to signal the PCM to turn the A/C Compressor clutch on. See wiring pages for further details.
Low Input (Pin 2 - Grey wire)	**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).

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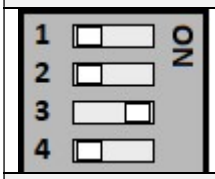
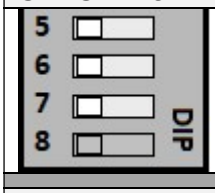
OUTPUT DESCRIPTIONS	
1 - Blue	**Oil Pressure Warning Lamp**
2 - Brown	**Engine Malfunction / MIL Lamp**
3 - Green	**Low Speed Cooling Fan** Connect to pin 85 of the relay used to switch the low-speed engine cooling fan. See wiring pages for further details.
4 - Yellow	**Power / Econ Shift Pattern Lamp** Auto trans applications. See wiring pages for further details.
5 - Violet	**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.

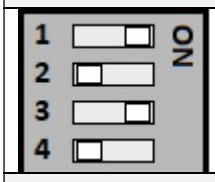
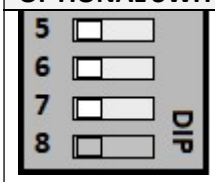
MODE 4 VT - VY PCM OUTPUT INTERFACE

MODE SWITCHES	DESCRIPTION
	This mode provides the same 5 outputs as mode 3, but requires both an existing PCM and BCM to be already connected. 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. 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.
OPTIONAL SWITCHES	
	

INPUT DESCRIPTIONS	
Switch 5	**Don't include ABS/TC data** 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.
Switch 6	**Don't include SRS data** 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.
Switch 7	**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.
High Input (Pin 1 - White wire)	N/A
Low Input (Pin 2 - Grey wire)	N/A

OUTPUT DESCRIPTIONS	
1 - Blue	**Oil Pressure Warning Lamp**
2 - Brown	**Engine Malfunction / MIL Lamp**
3 - Green	**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.
4 - Yellow	**Power / Econ Shift Pattern Lamp** Auto trans applications. See wiring pages for further details.
5 - Violet	**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.

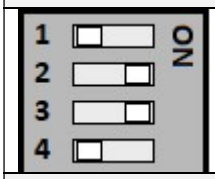
MODE 5 VT - VY PCM SIMULATOR

MODE SWITCHES	DESCRIPTION
 **OPTIONAL SWITCHES** 	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. 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). 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). Output 1 will be triggered when the BCM or Climate Control is requesting the PCM to have the A/C Compressor Clutch engaged. Output 2 will be triggered when the BCM is broadcasting its VATS code to the PCM, indicating the ignition key has been successfully read.

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.
High Input (Pin 1 - White wire)	**Request Oil Pressure Warning**
Low Input (Pin 2 - Grey wire)	**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

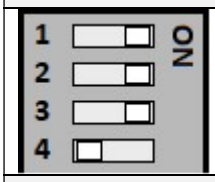
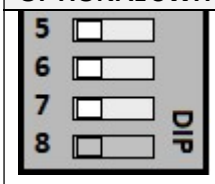
MODE 6 BCM BENCH SIMULATOR

MODE SWITCHES	DESCRIPTION
	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. The BCM/vehicle type must be configured using Switch 5. If a PCM is also connected, the 5 outputs and high input will operate the same as mode 3 (VT – VY BCM Simulator)
OPTIONAL SWITCHES	
	

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
High Input (Pin 1 - White wire)	**AC Request** Only with PCM connected, see mode 3
Low Input (Pin 2 - Grey wire)	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

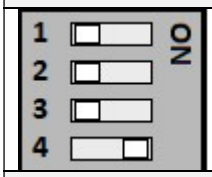
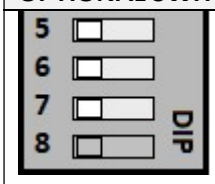
MODE 7 VT/VX MISSING MODULE SUPPORT

MODE SWITCHES	DESCRIPTION
	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. A VT/VX Instrument cluster must be used. The modules that are missing must be configured using switches 5 to 7. 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). Output 1 will be triggered when the BCM or Climate Control is requesting the PCM to have the A/C Compressor Clutch engaged. Output 2 will be triggered when the BCM is broadcasting its VATS code to the PCM, indicating the ignition key has been successfully read.
OPTIONAL SWITCHES	
	

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
High Input (Pin 1 - White wire)	**Request Oil Pressure Warning**
Low Input (Pin 2 - Grey wire)	**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

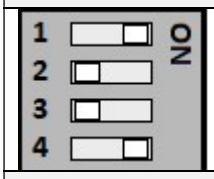
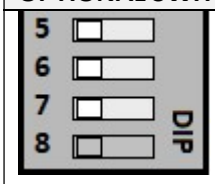
MODE 8 VY MISSING MODULE SUPPORT

MODE SWITCHES	DESCRIPTION
	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. A VY Instrument cluster must be used. The modules that are missing must be configured using switches 5 to 7. 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). Output 1 will be triggered when the BCM or Climate Control is requesting the PCM to have the A/C Compressor Clutch engaged. Output 2 will be triggered when the BCM is broadcasting its VATS code to the PCM, indicating the ignition key has been successfully read.
OPTIONAL SWITCHES 	

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
High Input (Pin 1 - White wire)	**Request Oil Pressure Warning**
Low Input (Pin 2 - Grey wire)	**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 9 LS1 PIM SUPPORT

MODE SWITCHES	DESCRIPTION
	This mode provides basic outputs and allows use of factory instrument clusters in LS1 applications. **The factory PIM module must be retained and operational.** The ALDL data connection is made to the PIM, which provides translation to the J1850 VPW / Class 2 protocol. The PIM will provide engine data, which is used by an instrument cluster and for the outputs. **The correct PIM must be used to match the cluster**. EG. VT / VX PIM with VT / VX cluster + VY / VZ PIM with VY / VZ cluster. The 5 outputs will work the same as Mode 3 (VT – VY BCM Simulator). There is normally no need to change any of the optional switches (5, 6 or 7) when using this mode.
OPTIONAL SWITCHES	
	

INPUT DESCRIPTIONS	
Switch 5	**Don't include ABS/TC data** This will disable the ABS/TC data that is normally simulated to prevent cluster warnings.
Switch 6	**Don't include SRS data** This will disable the SRS data that is normally simulated to prevent cluster warnings.
Switch 7	**Include ABS/TC status request** The ABS/TC status request should normally be disabled when used with a PIM. The factory LS1 ABS/TC module was connected to the J1850 VPW network, and the PIM translated and forwarded its status to the cluster. If the request is included, a functional ABS/TC module must be connected alongside the PCM, or the PIM will by default request the ABS/TC warning be displayed on the cluster.
High Input (Pin 1 - White wire)	**AC Request** This is used to signal the PIM an AC request from the BCM. The PIM passes this information onto the PCM. See wiring pages for further details.
Low Input (Pin 2 - Grey wire)	

OUTPUT DESCRIPTIONS	
1 - Blue	**Oil Pressure Warning Lamp**
2 - Brown	**Engine Malfunction / MIL Lamp**
3 - Green	**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.
4 - Yellow	**Power / Econ Shift Pattern Lamp** Auto trans applications. See wiring pages for further details.
5 - Violet	**Low Vehicle Speed** This 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.

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. It's 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.

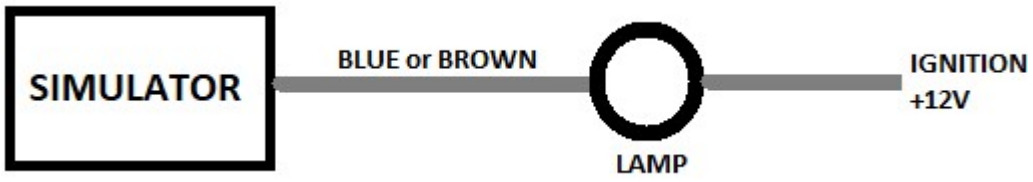
PCM Service Number	Applications	Earth	Ignition +12v	ALDL Data
16183082	VR Manual – V6 + V8	**A12** Black or L/Blue	**A6** Black or L/Blue	**A8** Black or L/Blue
16206305	VS I + II Manual – V8			
16176424	VR Auto – V6 + V8	**C2** or **C3** Black or L/Blue	**C1** Black or L/Blue	**C11** Black or L/Blue
16195699	VS I + II Auto – V8			
16199728	VS V6 – Auto + Manual	**A1** or **A2** Pink	**A4** Pink	**A3** Pink
16210672	VS V6 – Supercharged			
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, it's 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 watts maximum.



Power / Econ Shift Pattern Indicator Lamp

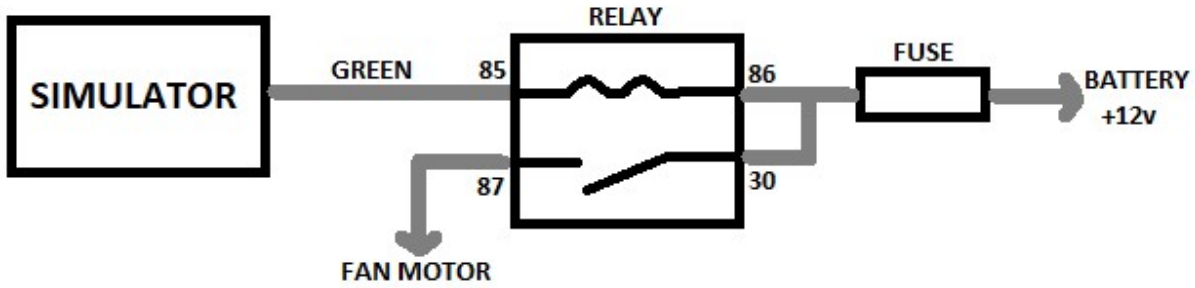
When using an Automatic VT, VX or VY PCM in modes 3 , 4 or 9, the Power/Econ shift pattern indicator can be used. The PCM will need a momentary push button input connected to the relevant pin to toggle the shift pattern.

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, 3 or 9.

The simulator high input A/C Request wire should receive +12v when the interior fan is on and the A/C dash switch is on. It will signal the PCM (or PIM in mode 9) to switch on the A/C Clutch Relay.

VT, VX, VY Instrument Clusters

With the simulator in modes 1 or 3, and using a VT to VY PCM (or mode 9 with a LS1 PIM), 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 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 descriptions for further details).

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 spliced straight to the ALDL data wire (red, pin 3) along with the PCM's red/black wire.