Connections and Wiring Reference

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Prerequisites

Documentation Retirement

This document was written in 2005 and last maintained in 2014. EFILive no longer provides bench harness wiring diagrams and recommends customers purchase a suitable bench harness and adaptors such as those produced by Bench Force.

This document has been retained for historical preservation; however, its contents may no longer be relevant to current products.

Intended Audience

EFILive Customers using the V8 Scan and Tune Tool software.

Computer Knowledge

It is expected that readers have a basic understanding of:

- The Windows operating system;
- Starting and using Windows applications;
- Navigating folders using Windows Explorer.

Tuning Knowledge

It is expected that readers have a basic understanding of:

- Electronic Fuel Injection;
- On Board Diagnostics.

And enough common sense to understand the following:

- Make small incremental changes;
- Only make minimal changes at a time;
- Evaluate and analyze the results of each change using the Scan Tool and/or other data logging devices before making the next change;
- Do not make changes that you do not understand;
- If you are unsure about making a particular change, ask a knowledgeable tuner first.

Introduction

What is EFILive?

EFILive is tuning software and hardware - it is not a tune. Together the software and hardware give users the tools to write tunes. EFILive does not provide tune files, tuning advice or support, but do provide software support and hardware support.

Bench Flashing

Bench flashing is an alternative to in-vehicle reading and flashing. While many controllers can be successfully flashed in-vehicle, there are a number of controllers and operations that are best performed outside of the vehicle using a bench harness.

VPW Controllers

LB7 and LLY controllers use a communications platform that is not very robust and was replaced in 2006. In many cases, these controllers fail with factory tools and will be unrecoverable.

The preferred method of reading and flashing LB7 and LLY controllers is to use a bench harness.

Dodge Cummins Controllers

In some flash failure instances the ECM may stop responding and cannot be recovered to normal operation by simply retrying the flash.

Such situations may occur if the ECM was flashed with a non-compatible operating system, or where the failed flash occurred right at the end of the process but the ECM thinks it completed.

In these situations, the ECM is usually only recoverable by forcing the ECM into ROM Boot Recovery mode. Specialized bench programming equipment, such as the BenchForce PowerBlock IV with ROM Boot Switch is required to perform this task.

Caution

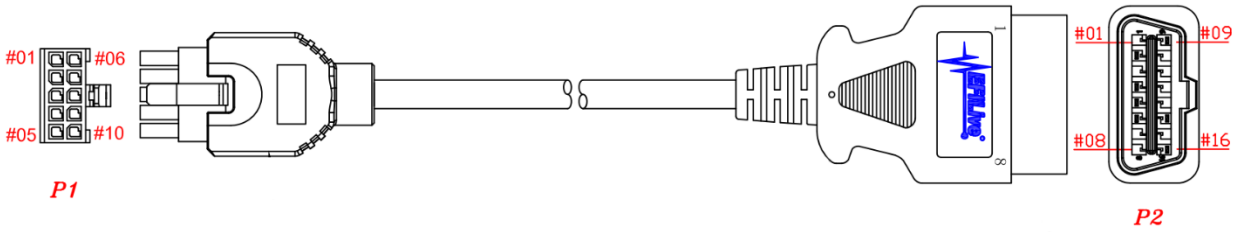
The information provided in this document is intended as a guide only. EFILive does not and cannot warrant that the information is correct. Please refer to manufacturer-specific vehicle schematics if you intend to build your own bench harness.

Extreme care must be taken when connecting any FlashScan device to a controller that is not fitted to a vehicle via factory connections and pin-outs.

Incorrectly connecting any voltage or ground pin will almost certainly damage FlashScan/AutoCal and the controller. Such damage is not covered by EFILive's warranty.

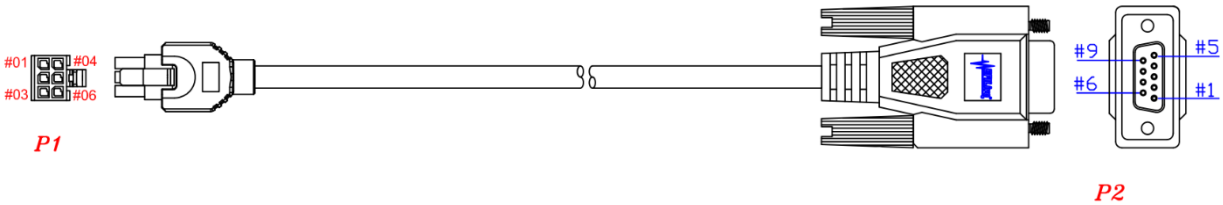
FlashScan/AutoCal V3 Cable Pin Assignments

OBDII



P1	Function	P2
1	Un-switched Battery Power	16
2	Signal Ground	4
3	CAN High	6
7	Chassis Ground	5
8	CAN Low	14
9	ALDL	9
10	VPW	2

Serial

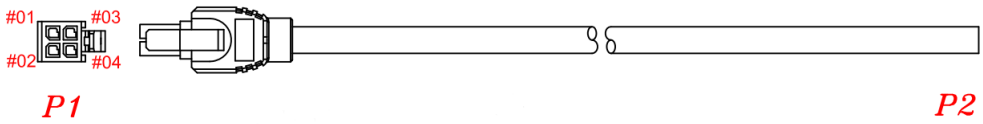


P1	Function	P2
4	RX <-> TX	2
5	TX <-> RX	3
6	Ground	5

The Serial cable is not shipped with FlashScan or AutoCal. It is available as on optional extra.

The Serial cable is can be used to connect FlashScan or AutoCal to a wide band controller for logging wide band AFR data.

CAN



P1	Function	P2
1	Ground	
2	Switch	
3	CAN Low	
4	CAN High	

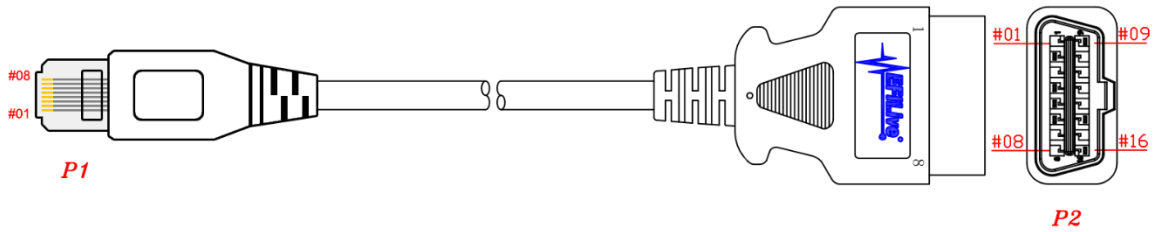
The CAN cable is not shipped with FlashScan or AutoCal. It is available as on optional extra.

The secondary CAN interface is not implemented. In future it may be implemented if/when EFILive offers integration to third party products via the secondary CAN interface.

The switch option allows a remote, momentary switch (between Switch and Ground, i.e. pins 1 and 2) to be attached to FlashScan or AutoCal that can be used to start/stop data logging. That is useful for starting/stopping data logging via a dashboard mounted switch.

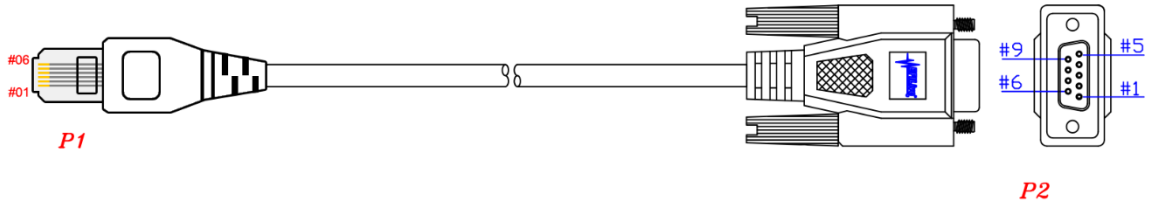
FlashScan/AutoCal V2 Cable Pin Assignments

OBDII



P1	Function	P2
1	Un-switched Battery Power	16
2	CAN High	6
3	CAN Low	14
4	Chassis Ground	5
5	Not Used	
6	VPW	2
7	ALDL	9
8	Signal Ground	4

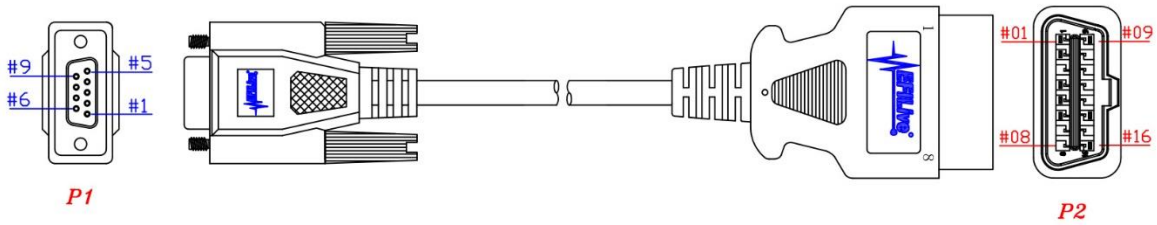
FlashScan V2 Serial



P1	Function	P2
1	RX <-> TX	2
2	TX <-> RX	3
5	Ground	5

FlashScan V1 Cable Pin Assignments

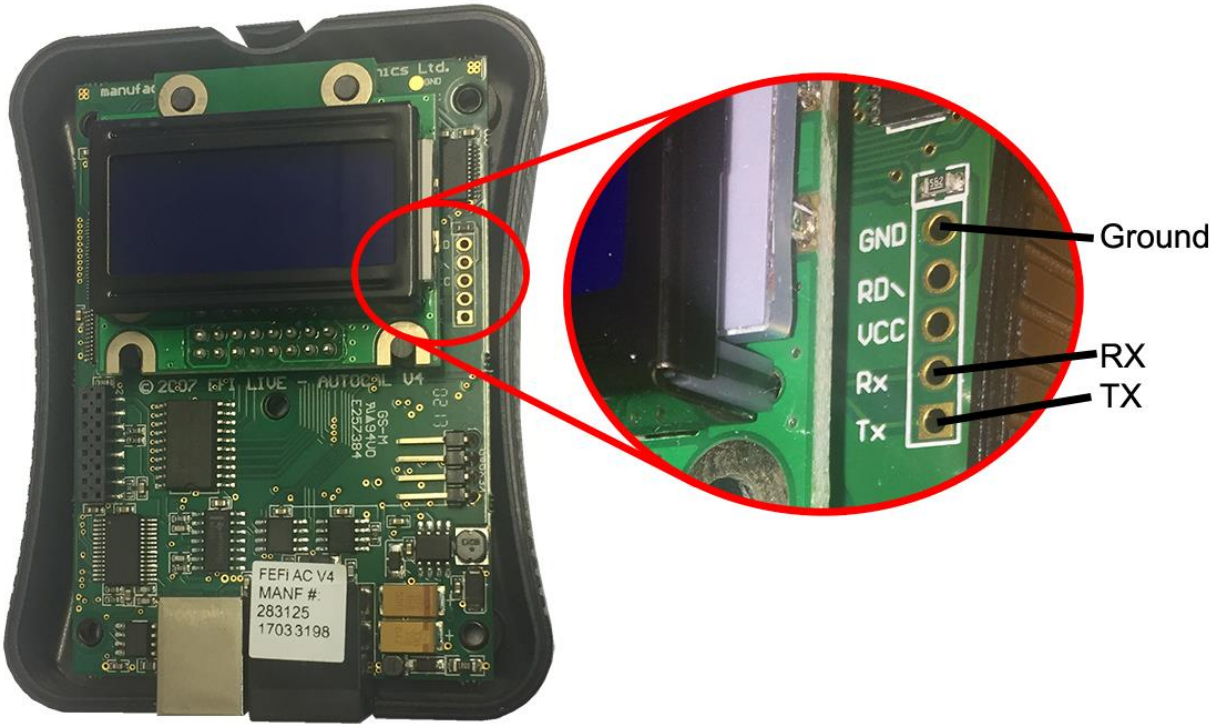
OBDII



P1	Function	P2
1	Signal Ground	5
2	Chassis Ground	4
3	CAN Single Wire (Not Used)	1
6	CAN High (Not Used)	6
7	VPW	2
8	CAN Low (Not Used)	14
9	Un-switched Battery Power	16

AutoCal V2 Serial

AutoCal V2 does not expose the serial connection externally. The internal serial interface is available via direct connection to the circuit board but opening AutoCal's enclosure will void the warranty.

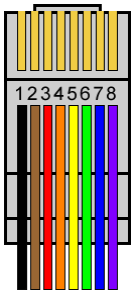


Bench Harness Pin Assignments

FlashScan OBDII Cable Pin Assignments

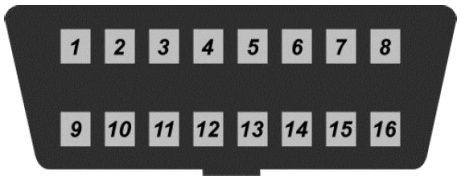
FlashScan V3
Molex Cable Plug

FlashScan V2
RJ-45 Cable Plug



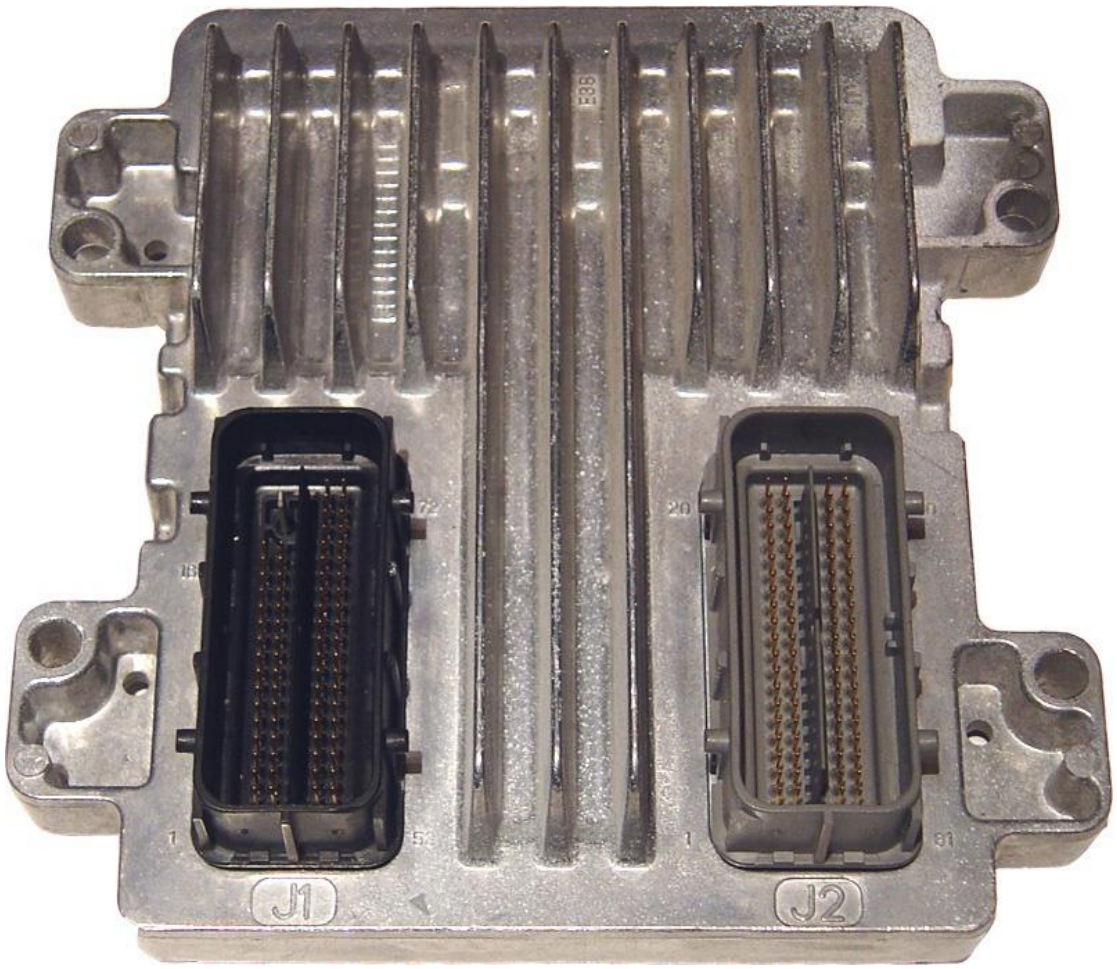
Vehicle OBDII Connector Pin Assignments

Vehicle SAE J1962 OBDII Socket



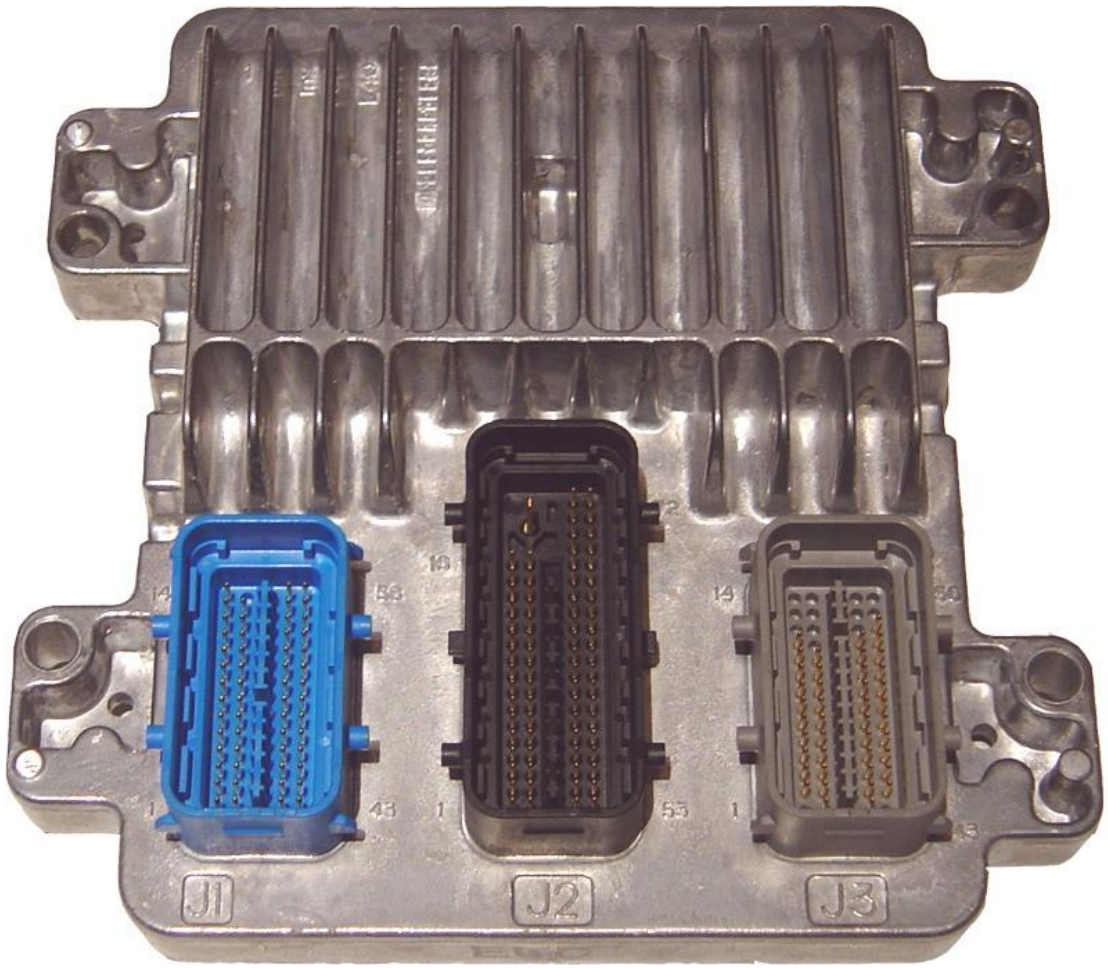
SAE J1962 Socket	
1. GM CAN (Low-speed, Single-wire)	9. GM ALDL (OBD-I 8192bps)
2. SAE J1850-VPW Positive	10. SAE J1850-VPW Negative
3. Discretionary *	11. Discretionary *
4. Chassis Ground	12. SCI RX (Engine) & Flash Strobe
5. Signal Ground	13. Discretionary *
6. ISO 15765-4 CAN High	14. ISO 15765-4 CAN Low
7. ISO 9141-2 & ISO 14230-4 K-Line SCI TX (Engine)	15. ISO 9141-2 & ISO 14230-4 L-Line
8. Discretionary *	16. Un-switched Battery Power

E38 Controllers



Controller	IGN SW	OBDII	V1	V2	V3	Description
Black 13		4,5	Not Supported	4,8	2,7	Ground
Black 20		16		1	1	12V Unswitched
Black 19	●					12V Switched
Black 47	●					12V Switched
Black 28		6		2	3	CAN +
Black 27		14		3	8	CAN -

E40 (Gen-IV V8) and LLY Diesel Controllers



Controller	IGN SW	OBDII	V1	V2	V3	Description
Blue 7		4,5	1,2	4,8	2,7	Ground
Blue 20		16	9	1	1	12V Unswitched
Blue 18	●					12V Switched
Blue 19	●					12V Switched
Blue 1		6		2	3	CAN +
Blue 2		14		3	8	CAN -
Blue 15		2	7	6	10	VPW Serial Data

LLY (VPW Serial Data) is supported by FlashScan V1 and FlashScan V2.

E40 (CAN+/CAN-) is only supported by FlashScan V2.

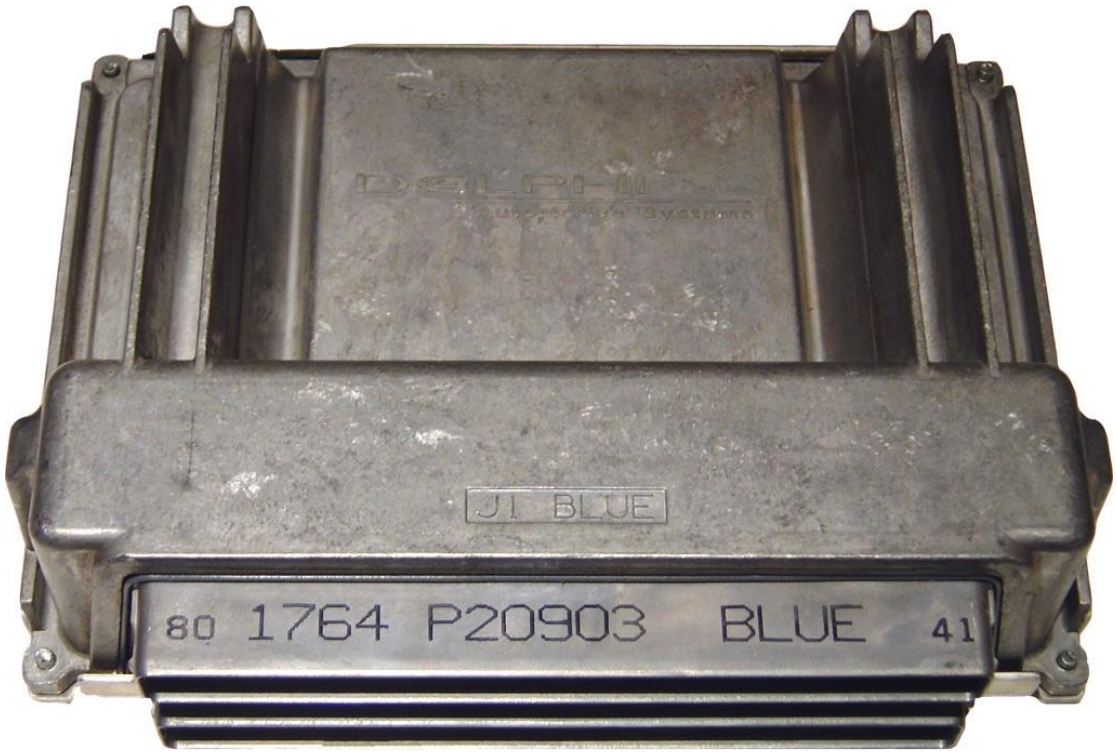
E67 Controllers

Controller	IGN SW	OBDII	V1	V2	V3	Description
Black 23		4,5	Not Supported	4,8	2,7	Ground
Blue 20		16		1	1	12V Unswitched
Black 13	•					12V Switched
Blue 18	•					12V Switched
Blue 19	•					12V Switched
Grey 53		6		2	3	CAN +
Grey 33		14		3	8	CAN -

1997/1998 LS1A Style Controller

Controller	IGN SW	OBDII	V1	V2	V3	Description
Blue 21		4,5	1,2	4,8	2,7	Ground
Blue 20		16	9	1	1	12V Unswitched
Blue 61		16	9	1	1	12V Unswitched
Blue 19	●					12V Switched
Blue 58		2	7	6	10	VPW Serial Data

1999-Current LS1B, LB7, Early V6 and 4 Cylinder Style Controllers

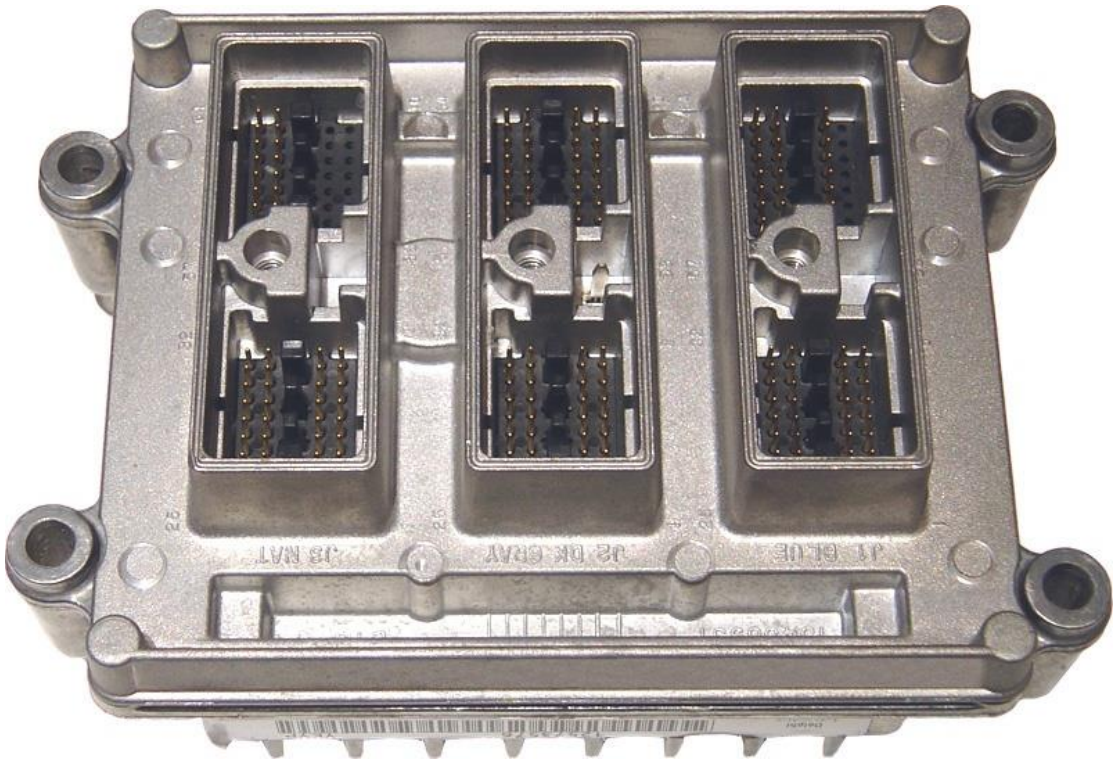


Controller	IGN SW	OBDII	V1	V2	V3	Description
Blue 60		4,5	1,2	4,8	2,7	Ground
Blue 20		16	9	1	1	12V Unswitched
Blue 19	•					12V Switched
Blue 58		2	7	6	10	VPW Serial Data

1998+ Vortec Black Controllers

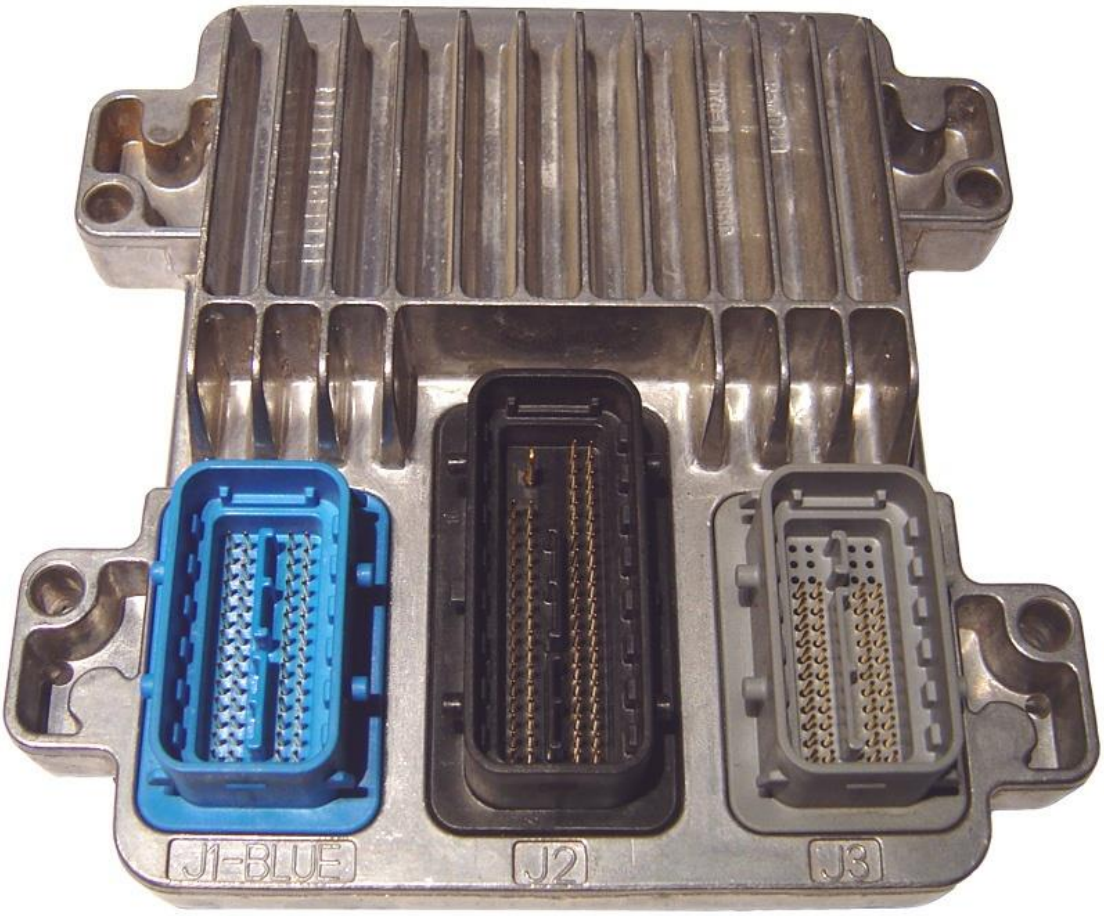
Controller	IGN SW	OBDII	V1	V2	V3	Description
White 18		4,5	1,2	4,8	2,7	Ground
White 21		16	9	1	1	12V Unswitched
Black 13	●					12V Switched
Black 18	●					12V Switched
Black 11		2	7	6	10	VPW Serial Data

P10 In-line 6 Cylinder Controllers



Controller	IGN SW	OBDII	V1	V2	V3	Description
Blue 8		4,5	1,2	4,8	2,7	Ground
White 16		4,5	1,2	4,8	2,7	Ground
Blue 20		16	9	1	1	12V Unswitched
Blue 19	●					12V Switched
Blue 21	●					12V Switched
White 17	●					12V Switched
Blue 58		2	7	6	10	VPW Serial Data

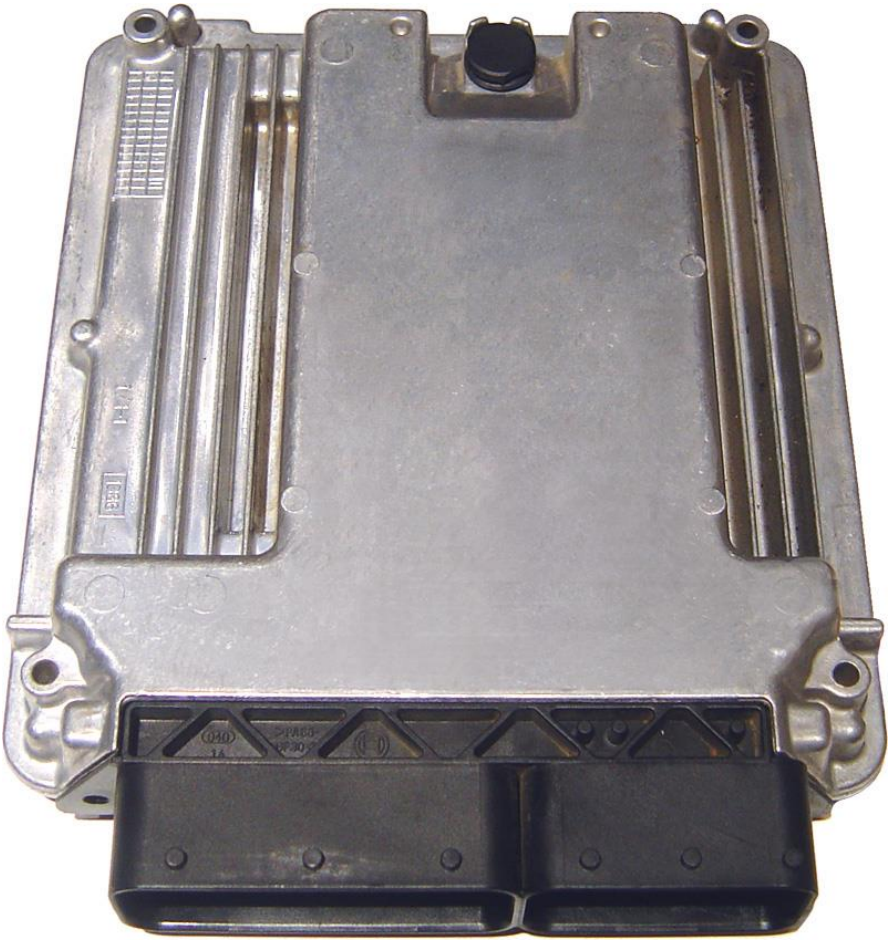
P12 Atlas Engine (In-line 4&5 Cylinder) Controllers



Controller	IGN SW	OBDII	V1	V2	V3	Description
Blue 7		4,5	Not Supported	4,8	2,7	Ground
Blue 20		16		1	1	12V Unswitched
Blue 18	•					12V Switched
Blue 19	•					12V Switched
Blue 1		6		2	3	CAN +
Blue 2		14		3	8	CAN -
Blue 15		2		6	10	VPW Serial Data

Note: The pin out configuration for this PCM is the same as the E40 / LLY.

LBZ/LMM Controllers



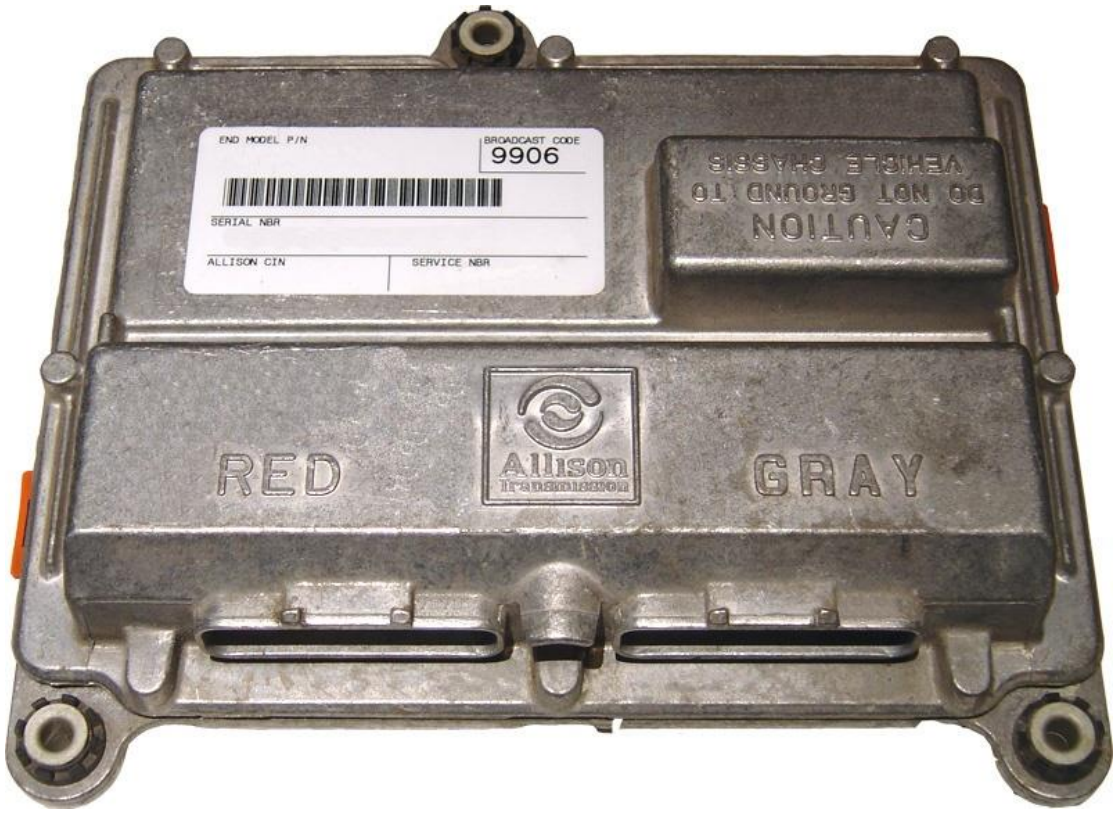
Controller	IGN SW	OBDII	V1	V2	V3	Description
Small 2		4,5	Not Supported	4,8	2,7	Ground
Large 77		16		1	1	12V Unswitched
Small 1	●					12V Switched
Small 21	●					12V Switched
Small 56	●					12V Switched
Large 76	●					12V Switched
Small 57		6		2	3	CAN +
Small 44		14		3	8	CAN -

T42 Transmission Controllers

Controller	IGN SW	OBDII	V1	V2	V3	Description
49		4,5	Not Supported	4,8	2,7	Ground
32		16		1	1	12V Unswitched
11	●					12V Switched
31	●					12V Switched
38		6		2	3	CAN +
37		14		3	8	CAN -

Requires ECM to be connected to the CAN bus for correct CAN termination.

Allison 5 speed Transmission Controllers



Controller	IGN SW	OBDII	V1	V2	V3	Description
Grey 1		4,5	1,2	4,8	2,7	Ground
Grey 3		16	9	1	1	12V Unswitched
Grey 4	●					12V Switched
Grey 30		2	7	6	10	VPW Serial Data

Allison 6 speed Transmission Controllers

Controller	IGN SW	OBDII	V1	V2	V3	Description
9		4,5	Not Supported	4,8	2,7	Ground
10		16		1	1	12V Unswitched
63	●					12V Switched
6		6		2	3	CAN +
27		14		3	8	CAN -

Requires ECM to be connected to the CAN bus for correct CAN termination.