



Cool Engine Shutdown

Installation Instructions

Part# 1081100

<i>An X-Monitor Xcessory for:</i>	
Dodge Cummins	1994-2006
Ford Powerstroke (6.0/7.3L)	1999-2006
GMC/Chevy Duramax	2001-2006

*** Please read this manual before starting installation. ***
OWNER'S MANUAL - LEAVE IN GLOVE BOX

Install Manual Part # I1081100
 Printed in Canada

BD Engine Brake Inc.

Plant Address: Unit A10, 33733 King Rd, Abbotsford, BC, Canada V2S 7M9

U.S. Shipping Address: 88-446 Harrison St, Sumas, WA 98295 U.S. Mailing Address: P.O. Box 231, Sumas, WA 98295

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Welcome

Thank you for purchasing the Cool Engine Shutdown accessory for your BD X-Monitor. This manual is divided into different areas to assist you with your installation and operation of this unit. If there is any missing parts or if you have technical questions about this product then please phone our tech-line at (800) 887-5030.

Kit Contents

- Qty. 1 - Cool Engine Shutdown Module
- Qty. 1 - 5-Terminal Connector (for module)
- Qty. 1 - 18" Communications Cable
- Qty. 36" - Tan Wire
- Qty. 36" - Pink Wire
- Qty. 36" - Green Wire
- Qty. 36" - Blue Wire
- Qty. 4 - Gray Posi-Tap (18-22ga) Connector
- Qty. 4 - Black Posi-Tap (12-18ga) Connector
- Qty. 2 - Green Posi-Tap (10-12ga) Connector

Required Tools

- Wire strippers
- Wire crimpers
- Pliers (Needle or Flat Nose)
- Small flat nose screwdriver
- Soldering gun (*optional*)
- Heat shrink or liquid tape (*optional*)

Accessory Options

- **1081120** - Red LED Alarm Kit
- **1081123** - Amber LED Alarm Kit

NOTE: The ground terminals of the vehicle's batteries should be disconnected before performing any taping onto any ECM/PCM wire.

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Compatibility

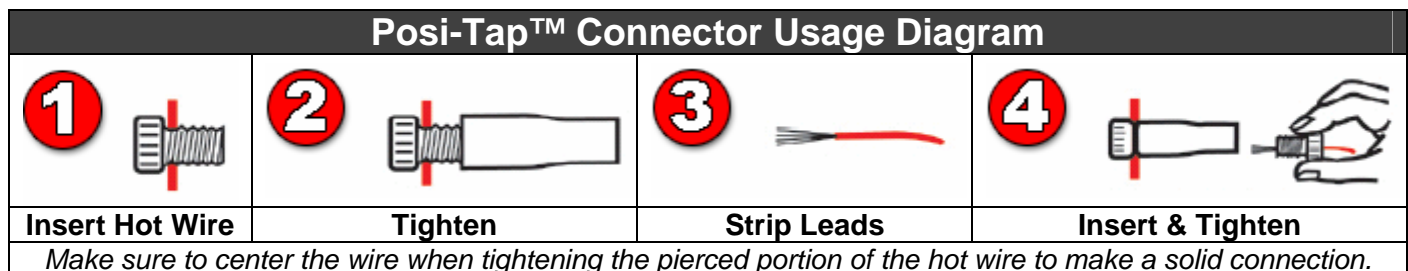
If the X Monitor displays the two (2) readouts "PYRO" and "TURBO" only and is version 1.xx or 2.xx, the module and display will have to be updated so the CES will be compatible. Call 1-800-887-5030 and ask for the claims division to arrange for this update. All other units that display three (3) measurements do not need upgrading.

Notes on Connectors

The kit includes a number of Posi-Tap™ connectors (Gray/Black/Green) to tap onto OEM wiring. It is important to select the correct color of connector so that it matches the gauge of the OEM wire that it is being installed on. Using the incorrect connector could cause an inadequate connection and/or the OEM wire could be severed.

OEM Wire	Posi-Tap™ Color
18-22ga	Gray or Red
12-18ga	Black
10-12ga	Green or Yellow

Though these connectors offer a quicker installation, the best option would be to solder the wires and isolate the joints with heat shrink or liquid electrical tape. Proper soldering techniques should be used to ensure adequate connections.



What is the COOL ENGINE SHUTDOWN (CES)?

The CES is designed to keep the engine running when the ignition key is turned off and the exhaust temperature is above a set point (between 250-550°F) to prevent turbocharger bearing failure that could occur when the engine is shutdown too quickly.

A typical turbocharger can spin in excess of 100,000rpm under load, which will continue spinning when the engine is turned off.

The turbocharger is lubricated and cooled by engine oil - when the engine is turned off, that oil supply is cut off. If a turbocharger is still spinning at a high RPM when the oil supply is cut off, the internal bearings will utilize what remaining oil is left around them

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then start to heat up, essentially cooking the oil which causes premature bearing failure. By allowing the turbocharger to slow down to a safe RPM, this bearing failure can be prevented. An efficient means of gauging a safe time to turn the engine off is by the exhaust temperature.

A good temperature range to go by is when a turbocharger is below 400°F (with the thermocouple mounted post-turbo) it is safe to turn off the engine. The further away the probe is away from the turbocharger, the shut-off temperature should be lower. If the thermocouple is mounted pre-turbo, then the shut-off temperature can be higher.

How does the COOL ENGINE SHUTDOWN work?

The CES module utilizes the data being transmitted between the X-Monitor controller and display to constantly monitor the exhaust temperature. When the key is turned off and the exhaust temperature is above the shutdown setting, the CES module will keep power supplied to the ECM/PCM, which in turn will keep the engine running until the temperature falls below the setting.

Precautions

The CES will **not** lock the doors or set the alarm. With most vehicles, once you shut the door you can use the keyless remote or key to lock the doors.

Most OEM and aftermarket alarms will have to be activated after the CES has shutdown the engine. Due to the wide variety of the alarms and immobilizers, it is best to test the system(s) thoroughly to ensure proper procedures of activation or use in conjunctions with the CES.

Proper parking procedures should be adhered to before leaving the vehicle including the engagement of the parking brake. Children or animals should not be left unattended in the vehicle while the CES is keeping the vehicle running.

Safety Features

The CES module has a few safety features built in that the driver should be aware of. If for some reason the exhaust temperature does not fall below of shutdown setting within five (5) minutes from the key being turned off, the CES will automatically shutdown the engine.

The CES module is also designed to monitor the vehicle's hydraulic brakes when it is connected to the brake pedal switch via the Brake Pedal terminal on the module. While the CES module is keeping the engine alive (ignition key turned off and exhaust temperature above the shutdown setting), if the brake pedal is depressed the CES will

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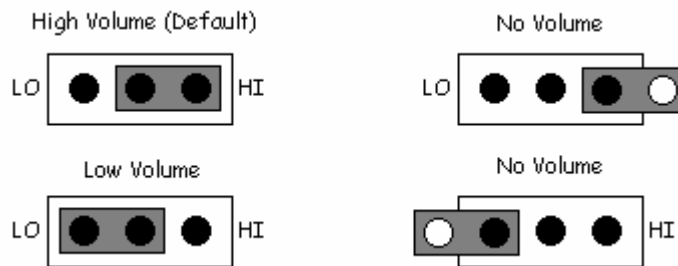
shutdown the engine. This was implemented to protect the vehicle from being stolen when the engine is in cool down mode; eventually the brake pedal would have to be pressed which will shutdown the engine preventing the thief from easily driving away with the vehicle. This is also useful in situations where the engine needs to be shutdown immediately or is desired to be shutdown sooner.

Audible Alarm

As an added bonus to the engine shutdown function of the CES, there is an audible alarm built into the module. While monitoring the data between the X Monitor controller and display for the exhaust temperature, the CES also is looking for any registered alarms flashing on the display. When the alarm is flashing, the CES module will emit a repeating tone that will stop when the alarm stops flashing on the display. There are three volume settings for the audible alarm: high (default), low and off.

The volume of the audible alarm is can be adjusted by a jumper setting inside the module. To do this, with the communication cables and the 5-terminal connector unplugged, remove the screw on the back of the module and take the top cover off. In the upper left section of the board, near the display communication connector, there is a 3-pin connector with a jumper.

For high and low volume the jumper will connect the center pin and one the two (2) outer pins marked "HI" and "LO". For no alarm, place the terminal on either one of the outer pins and away from the center pin.



Wiring

Disconnect the communication cable from the X Monitor controller that leads to the display and insert into the port marked "Display" on the CES module. Utilizing the 18" communications cable supplied with the CES module, plug one end into the port marked "Controller" on the CES module and the other end into the display port on the X Monitor controller.

Using the following charts, tap onto the vehicles wires using the appropriate sized Posi-Tap connector (not necessary if soldering the connections). All the vehicle wires are located under the dash.

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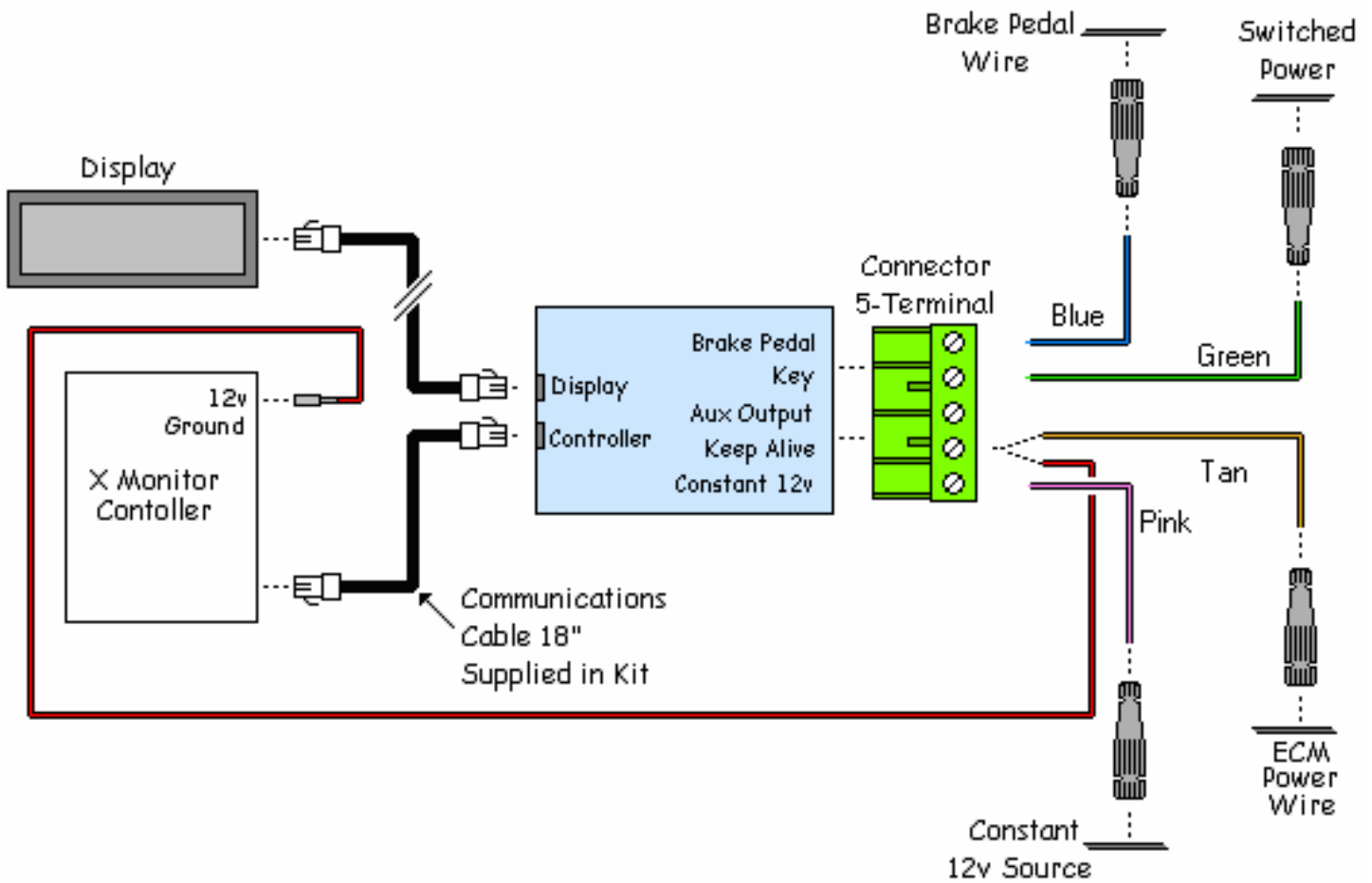
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Strip one end of each CES wire and attach a male blade connector to one end of each wire (not necessary if soldering the connections). Connect the wires to the Posi-Taps and run the free ends to the CES module, keeping clear of moving or heat-generating devices. Excess wire can be trimmed but please keep in mind that the module may have to be accessed to adjust the shutdown temperature or be removed to adjust alarm volume, so, we suggest leaving enough slack to perform these functions.

Strip each end of the wires and connect to the appropriate terminals on the 5-terminal connector as per the charts and diagrams. Tighten each terminal by turning the terminal screws clockwise until the wire is secure. Plug the 5-terminal connector into the CES module and leave the module in a location where it can be accessed for adjustments before final mounting.

NOTE: The 12v-power wire for the X Monitor module must be connected to the same line as the “Keep Alive” is connected (See applicable chart for your application on pages 8-12). Connect the power lead for the X Monitor module to the same “Keep Alive” terminal on the CES module.



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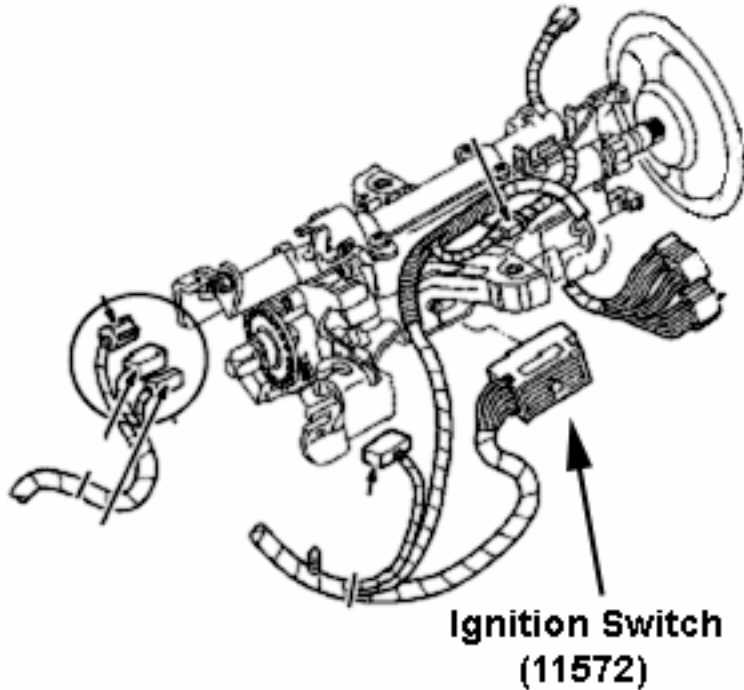
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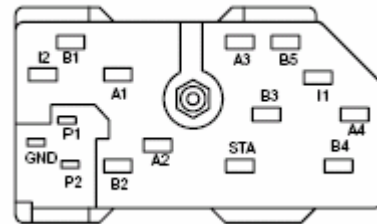
FORD POWERSTROKE WIRING DIAGRAM

Ford Connector

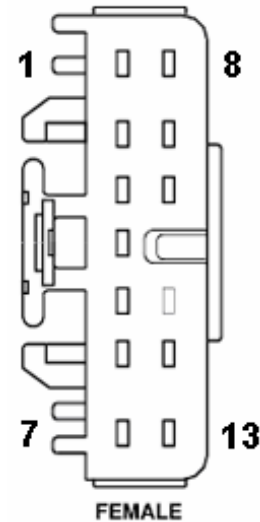
Steering Column



1994-2004 Fords



2005+ Fords



Connect the black wire to a good grounding point.

Model	Location	OEM Wire	Pin
Brake Pedal (Blue Wire)			
1994-2003 7.3L	Brake Pedal Switch	GN	
2003-2006 6.0L		RD/GN	
Key (Green Wire)			
1994-1997 7.3L	Ignition Connector C269	BK/LG 297	A1
1999-2003 7.3L		RD/BK 1040	A3
2003-2004 6.0L	Ignition Connector C250	RD/BK 1040	A3
2005-2006 6.0L		RD/BK 1040	13
Keep Alive (Tan Wire)			
1994-1997 7.3L	Ignition Switch Harness	RD/LG 16	I1
1999-2001 7.3L		RD/BK 1000	I1
2002-2003 7.3L		RD/LG 16	I1
2003-2004 6.0L		WH/YL 1044	I1
2005-2006 6.0L		RD/LG 16	1
Constant (Pink Wire)			
1994-2003 7.3L	Ignition Switch Harness	YE 37	B1 or B3
2003-2004 6.0L	Ignition Connector C250	YE 37	B1 or B3
2005-2006 6.0L		YE 37	7

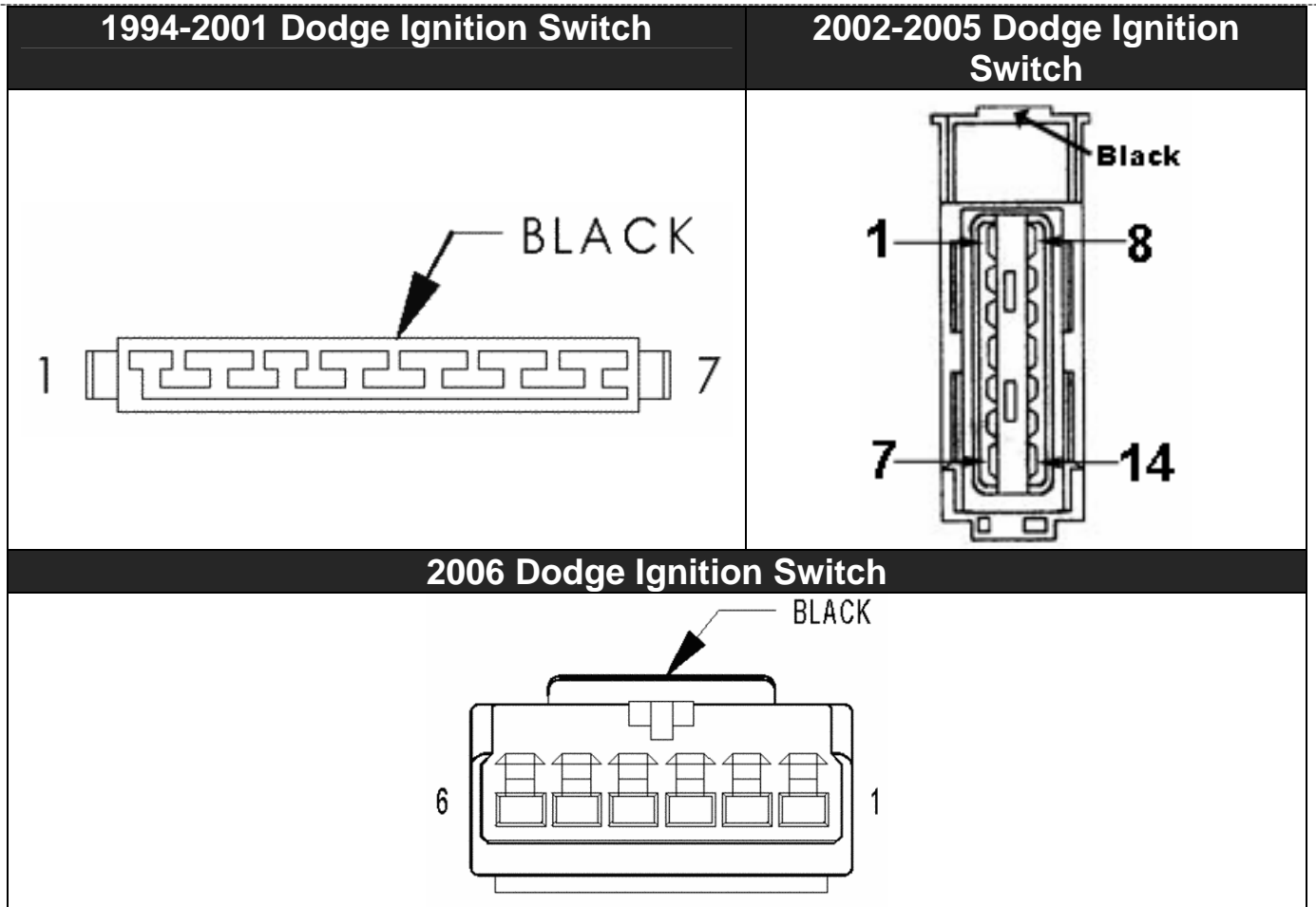
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DODGE CUMMINS WIRING DIAGRAM



Connect the black wire to a good grounding point.

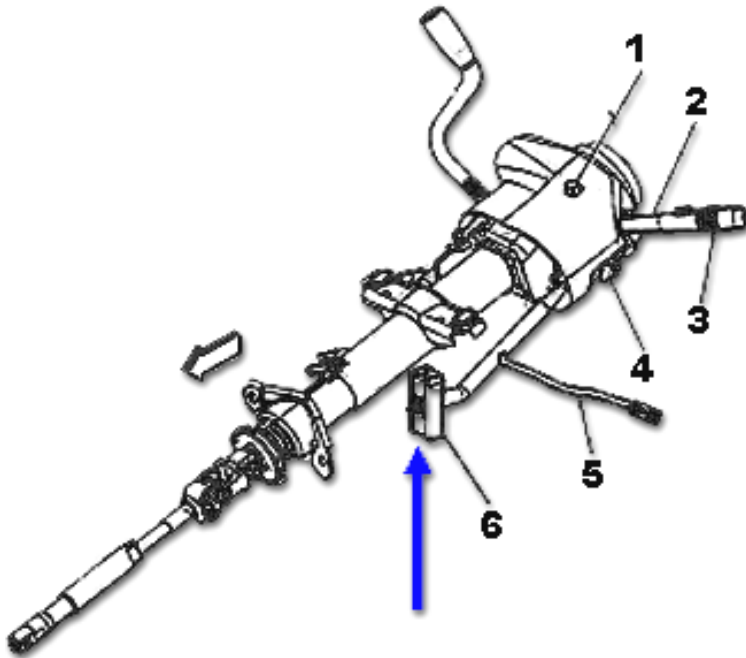
Model	Location	OEM Wire	Pin
Brake Pedal (Blue Wire)			
1994-2001	Brake Pedal Switch	WT/TN L50	5
2002-2006		WT/TN L50	2
Key (Green Wire)			
1994-2002	Ignition Switch Harness	BK/OR A22	5
2003		BK/WT A31	9
2004-2005		PK/YL F982	9
2006		PK/WT F20	3
Keep Alive (Tan Wire)			
1994-2002	Ignition Switch Harness	DB A21	2
2003		DB A21	3
2004-2005		PK/LG F951	3
2006	ECM Connector (C2)	PK/GY	32
Constant (Pink Wire)			
1994-2002	Ignition Switch Harness	RD A1	7
2003		RD A1	4
2004-2005		RD A951	4
2006		LB/RD A106	6

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DURAMAX WIRING DIAGRAMS**Duramax Ignition Connector Location**Legend

1. Hazard Button
2. Multi-Function Lever
3. Cruise Control Switches
4. Tilt Steering Actuator
5. Inflatable Restraint Harness
6. C201 In-line Connector

Connect the black wire to a good grounding point.

Model	Location	OEM Wire	Pin
Brake Pedal (Blue Wire)			
2001-2002	Ignition Connector C201	WT 17	A1
2003-2006	Brake Pedal Connector	WT 5689	2
Key (Green Wire)			
2001-2002	Ignition Connector C201	BRN 41	A13
2003-2006		BRN 41	B18
Keep Alive (Tan Wire)			
2001-2006	Ignition Connector C201	PNK 139	A2
Constant (Pink Wire)			
2001-2002	Ignition Connector C201	RD 242	B1
2003-2006		RD 342	C1

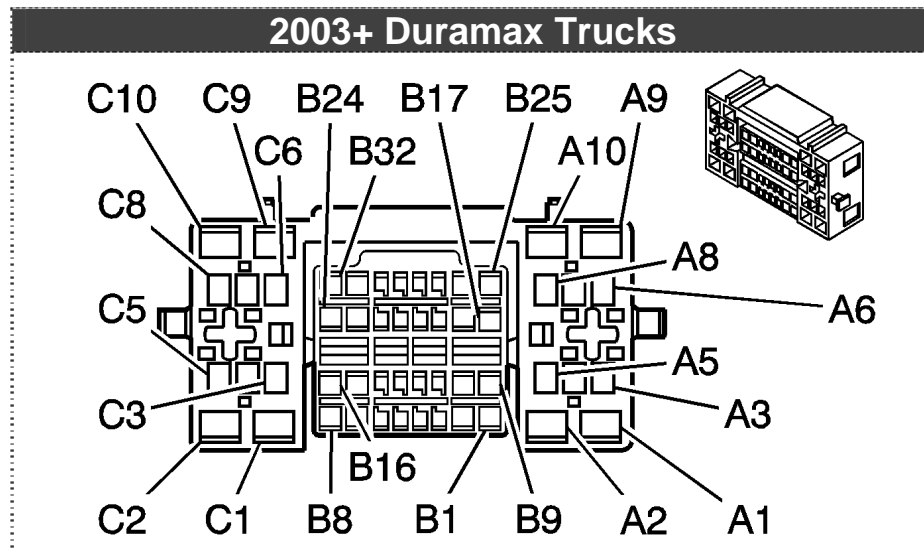
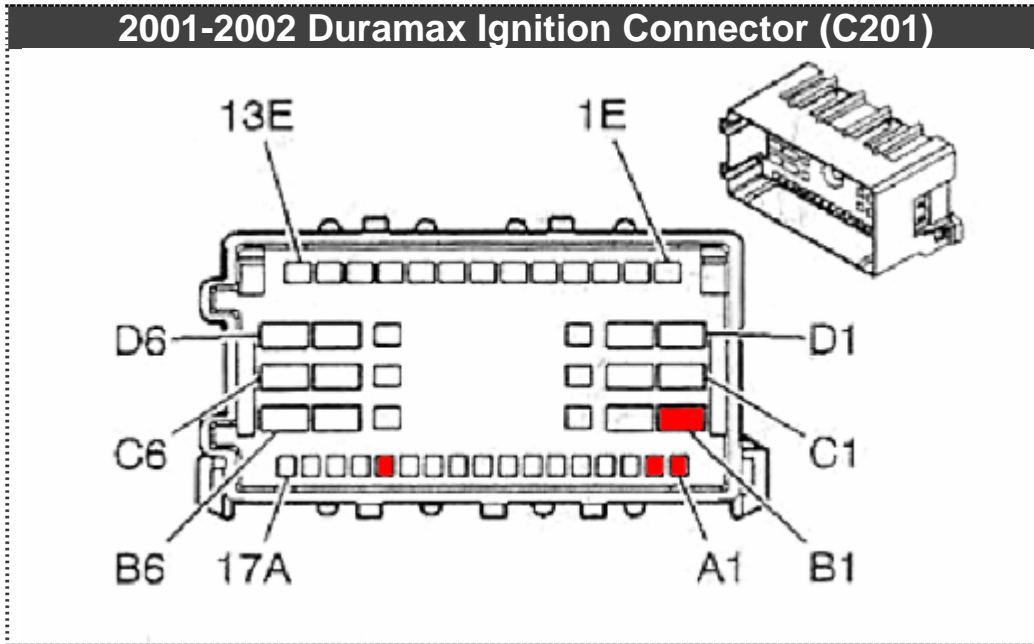
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DURAMAX WIRING DIAGRAMS (cont'd)... ---



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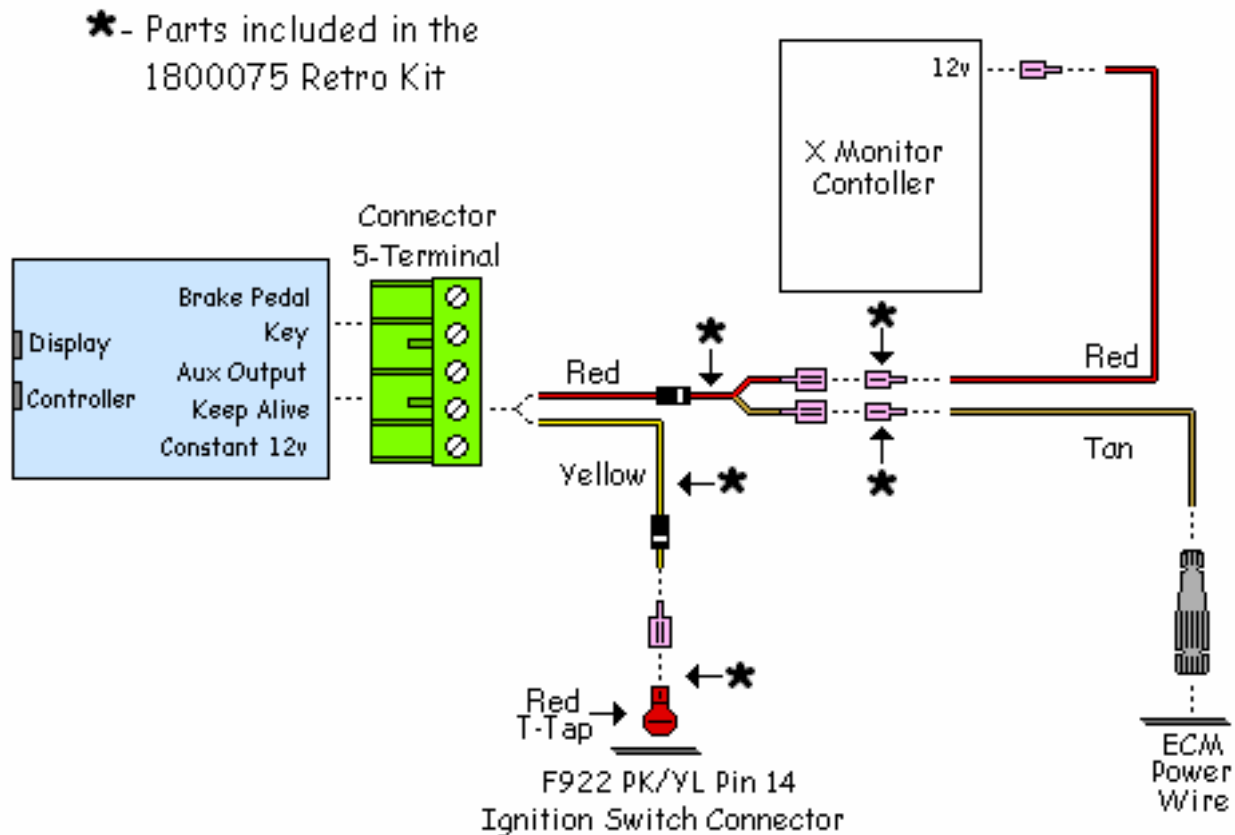
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Wastegate Solenoid Power Harness (2004½-05 Dodges Only)

2004½-05 Dodge trucks have a wastegate solenoid that requires power when the CES keeps the ECM alive in cool down mode. You may notice that the check engine light comes on (with codes P0480 & P0243) approximately 30 seconds after the key is turned off. To avoid this requires some extra wiring with diodes to prevent back feeding power.

The codes being sent do not affect performance or drivability in any way but only causes the annoyance of the engine light coming on. See the diagram below for reference.



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Temperature Adjustments

The shutdown temperature can be set by using a small flat-head screw driver to adjust the potentiometer that can be accessed through the hole on top of the CES module with the markings "550", "400" and "250".

By turning the screw clockwise until the potentiometer stops the CES will shutdown at approximately 550°F; by turning all the way counter clockwise the CES will shutdown at approximately 250°F. The markings are a general guide as to what the approximate setting will be; the CES may have to be adjusted a few times until the desired shutdown temperature is achieved.

Communication / Operation Lights

Through the translucent blue case of the CES module, there will be a Green and Red LED visible during the operation of the CES. The Green LED will blink when the CES senses communication between the X Monitor display and module. The Red LED will light up when the exhaust temperature is above the shutdown temperature setting.

Mounting

Once all the wiring and adjusting has been performed, secure or mount the CES module so that it is not interfering with feet and moving parts or near direct heat. Some examples are to use Velcro to mount to the firewall or to the back of the X Monitor module. Being that the CES module is light, it can be suspended if the wiring is secure.

Optional LED Alarm

For those who wish to use an LED for the alarm instead of, or, in conjunction with the audible alarm, the CES module can control the grounding of a LED through the "Aux Output" terminal. This terminal could be used to control the grounding of other devices but is only rated to a maximum of 0.5 amps; exceeding this rating will void the warranty.

To mount the LED, drill a 0.250" hole in the desired location. From the front, push the bezel into the hole you just drilled. From the backside, push the LED into the bezel until it clicks into place, the flange at the base of the LED will be inside the bezel and the LED will protrude by about 1/8" out the front of the bezel. Push the collar up the wires and over the bezel/LED until it securely clicks into place.

Run the wires down to the CES and X Monitor modules keeping them from interfering with moving or heated parts. With the black wire trim any excess, strip the end and

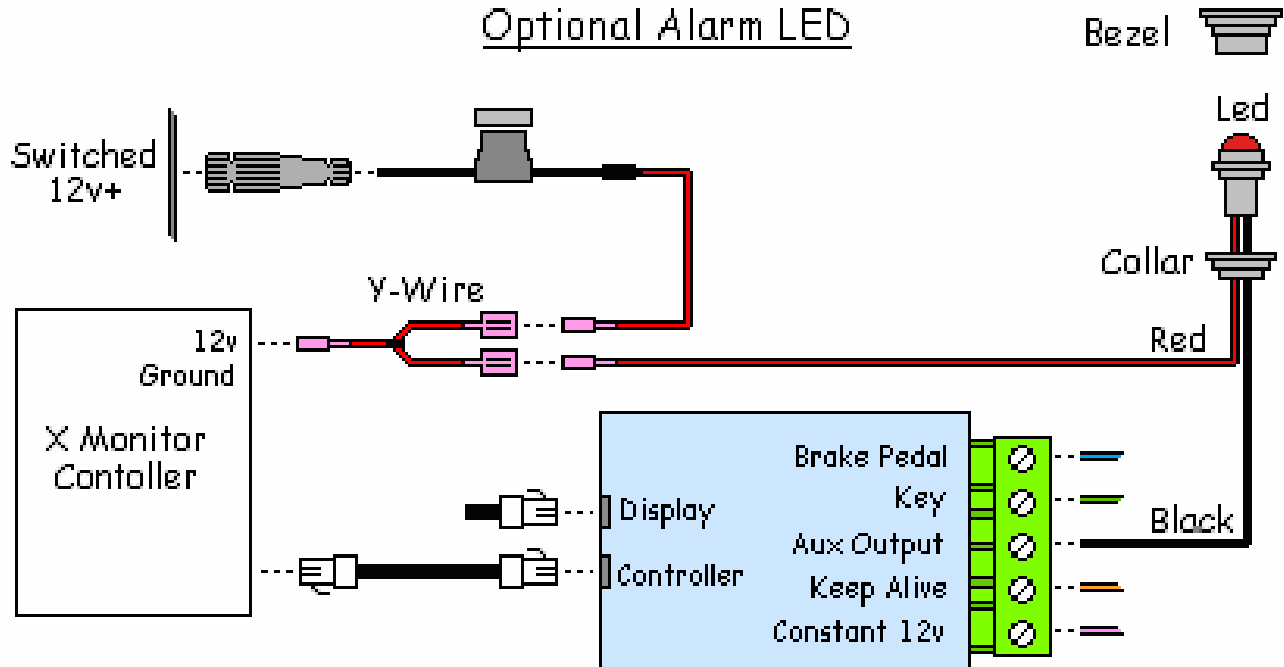
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insert into the "Aux Output" terminal on the CES module. With the Red wire trim any excess, strip the end and attach a blade connector. On the X Monitor module, disconnect the power lead and replace with Y-wire connected. Connect the LED's Red wire to the Y-Wire.



Wire Color Glossary

BK	Black	In the wiring diagrams, there are usually two wire colors for each OEM wire, for example: RD/LB. This means it's a red colored wire with a light blue tracer.
BR	Brown	
DB	Dark Blue	
GN	Green	
GY	Gray	
LB	Light Blue	
LG	Light Green	
OR	Orange	
PK	Pink	
RD	Red	
TN	Tan/Light Brown	
WT	White	
YL	Yellow	

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Questions?

If you have any technical issues, problems or questions with this product, then please phone our Technical Support Hotline at (800) 887-5030, Monday to Friday, between 8:30am-5:00pm Pacific Standard Time (PST). As an alternative, you can also post a question or comment on our e-support forum, located at <http://www.bd-power.com/forum/>.



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BD ENGINE BRAKE, INC.
LIMITED WARRANTY STATEMENT

THE INSTALLATION OF THIS PRODUCT INDICATES THAT THE BUYER HAS READ AND UNDERSTANDS THIS AGREEMENT AND ACCEPTS ITS TERMS AND CONDITIONS.

DISCLAIMER OF LIABILITY

BD Engine Brake Inc., its successors, distributors, jobbers, and dealers (hereafter "**BD**") shall in no way be responsible for the product's proper use and service. THE **BUYER** HEREBY WAIVES ALL LIABILITY CLAIMS.

BD disclaims any warranty and expressly disclaims any liability for personal injury or damages. **BD** also disclaims any liability for incidental or consequential damages including, but not limited to, repair labor, rental vehicles, hotel costs, or any other inconvenience costs by reason of use or sale of any such equipment. The **BUYER** acknowledges and agrees that the disclaimer of any liability for personal injury is a material term for this agreement and the **BUYER** agrees to indemnify **BD** and to hold **BD** harmless from any claim related to the item of any equipment purchased.

This warranty shall not apply to any unit that has been improperly stored or installed, or to misapplication, improper operation conditions, accidents, neglect, or which has been improperly repaired or altered or otherwise mistreated by the **BUYER** or his agent. **BD** also assumes no liability regarding the improper installation or misapplication of its products. It is the installer's responsibility to check for proper installation and if in doubt, contact the manufacturer.

LIMITATION OF WARRANTY

BD Engine Brake Inc. (hereafter "**BD**") warrants to the **BUYER** that any parts purchased shall be free from defects in material workmanship. A defect is defined as a condition within the product that would render the product inoperable. **BD** gives Limited Warranty as to description, quality, merchantability, fitness for any product's purpose, productiveness, or any other matter of **BD's** product sold herewith. **BD** shall be in no way responsible for the product's open use and service and the **BUYER** hereby waives all rights other than those expressly written herein. This Warranty shall not be extended or varied except by a written instrument signed by **BD** and the **BUYER**.

The Warranty is Limited to one (1) year from the date of sale and labor costs incurred by the removal and replacement of the BD product, while performing warranty work, will be covered for 1 (one) year, payable at BD rates, at authorized centers and with prior approval. Until BD has approved the claim, the consumer may be responsible for these costs.

A Return Authorization (WA) number, obtained in advance from **BD**, must accompany all products returned for warranty consideration. All products must be returned, shipping prepaid, to **BD** and must be accompanied by a dated proof of purchase receipt. All Warranty claims are subject to approval by **BD** and repaired or replaced product will be returned to the customer freight collect. Accepted warranty units, which have been replaced, become the sole property of **BD**.

This warranty is in lieu of all other warranties or guaranties, either expressed or implied, and shall not extend to any consumer or to any person other than the original purchaser residing within the boundaries of the continental U.S. or Canada.

IN THE EVENT THAT THE BUYER DOES NOT AGREE WITH THIS AGREEMENT, THE BUYER MAY PROMPTLY RETURN THIS PRODUCT, IN A NEW AND UNUSED CONDITION, WITH A DATED PROOF OF PURCHASE, TO THE PLACE OF PURCHASE WITHIN THIRTY (30) DAYS FROM DATE OF PURCHASE FOR A FULL REFUND.

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