

BD Cool Down Timer 2

Part# 1081160

Application Chart --

Dodge Cummins (5.9/6.7)	1994-2008
Ford F Series (6.0/6.4/7.3L)	1994-2008
GMC/Chevy Duramax	2001-2009

*** **Please read this manual before starting installation.** ***

OWNER'S MANUAL - LEAVE IN GLOVE BOX

Install Manual Part # I1081160

Printed in Canada

BD Engine Brake Inc.

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Phone: 604-853-6096 Fax: 604-853-8749 Internet: www.dieselpower.com

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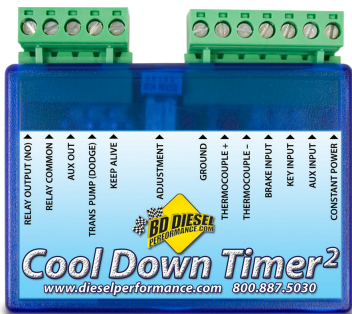
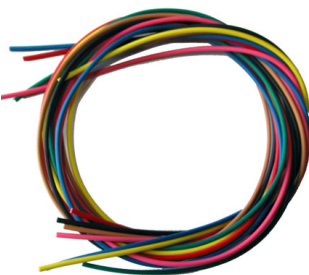




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Kit Contents

Please check to make sure that you have all the parts listed in this kit before you begin to install this kit.

BD Cool Down Timer 2 (P/N# 1081160)		
1801160	1801161	1801151
		
<i>CDT2 Control Module</i>	<i>CDT2 Wiring Harness</i>	<i>Ring Connector</i>
Qty: 1	Qty: 1	Qty: 2
1300348	1300349	1300350
		
<i>Posi-Lock Connector (18-22ga – Gray in color)</i>	<i>Posi-Lock Connector (12-18ga – Black in color)</i>	<i>Posi-Lock Connector (10-12ga – Yellow in color)</i>
Qty: 5	Qty: 2	Qty: 2

Required Tools

- Wire strippers
- Wire crimpers
- Small Flat Nose Screwdriver
- Pliers (Needle / Flat Nose)
- Soldering Gun (*Optional*)
- Heat Shrink / Liquid Tape (*Optional*)

Options

- 1081151 Probe (Thermocouple) Kit

Compatibility

This Cool Down Timer will work with virtually all “K” type of thermocouples offered by companies such as ISSPRO or EGT.

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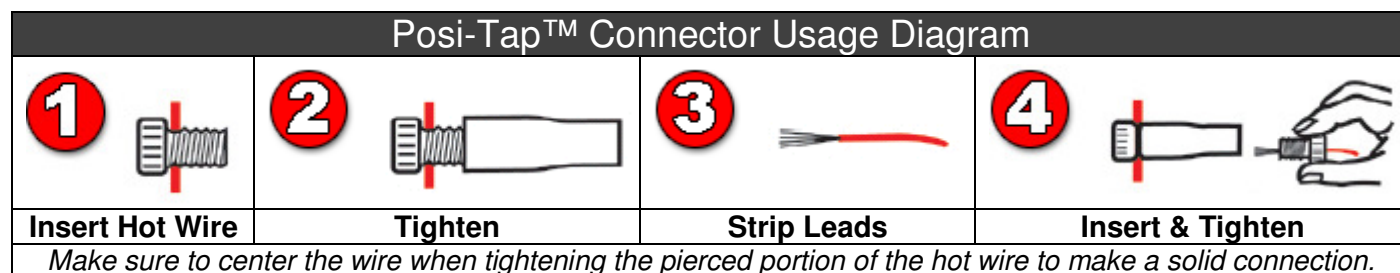
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Notes On Connectors

The kit includes a number of Posi-Tap™ connectors (Gray or Red/Black/Green or Yellow) 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
12-18ga	Black
10-12ga	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.



The ground terminals of the vehicle's batteries should be disconnected before performing any piercing/posi-tapping onto any ECM/PCM wire.

What Is The Cool Down Timer 2 (CDT2)?

The CDT2 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 shut down 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 the engine oil, and 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 around them 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.

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A very efficient means of gauging a safe time to turn the engine off is by the exhaust temperature. The suggested temperature range to go by is below 400°F (with the thermocouple mounted post-turbo). The further away the probe is away from the turbocharger, the lower the shut-off temperature should be. If the thermocouple is mounted pre-turbo, then the shut-off temperature can be higher.

How Does The Cool Down Timer 2 Work?

The CDT2 module utilizes the signal from the thermocouple that is measuring the exhaust gas temperature. The thermocouple may already be connected to a gauge or it can be connected to the CDT2 module on its own.

When the key is turned off and the exhaust gas temperature is above the shutdown setting, the CDT2 module will keep power supplied to the ECM/PCM, which in turn will keep the engine running until the temperature falls below the setting.

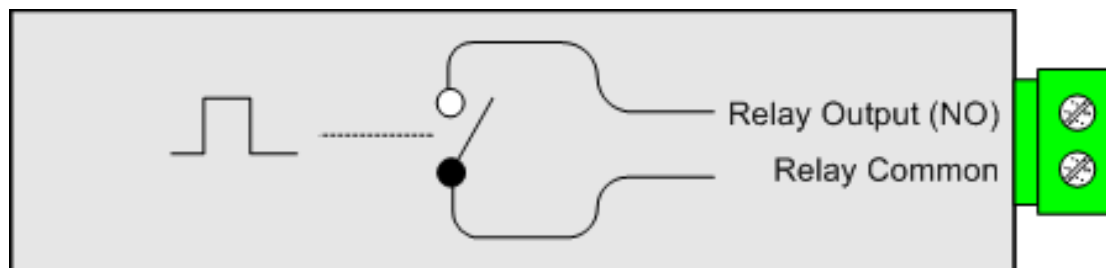
As well a new feature of the CDT2 is to shut the truck down based on an adjustable time. This time is adjustable using the potentiometer on the side of the control unit.

Precautions

The CDT2 by default 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 CDT2 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 CDT2.

The “Relay Output (NO)” and the “Relay Common” terminals can be configured to lock the doors automatically. Depending on the vehicle and the method of locking the doors you can wire either a Ground or 12V source to the “Relay Common” terminal. When the CDT2 shuts down the “Relay Common” terminal will be pulsed out to the “Relay Output (NO) terminal. See the below wiring diagram. Note BD cannot provide support on this option.



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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 CDT2 is keeping the vehicle running.

Safety Features

The CDT2 module has a few safety features built-in that the driver should be aware of. If for some reason the exhaust gas temperature does not fall below the shutdown setting within five (5) minutes from the key being turned off, the CDT2 will automatically shutdown the engine.

As well if the engine starts to initiate a REGEN cycle causing the EGT's to rise the CDT2 will shut the truck off.

The CDT2 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 CDT2 module is keeping the engine alive (ignition key turned off and exhaust gas temperature above the shutdown setting), if the brake pedal is depressed the CDT2 will 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.

Vehicle Wiring

Using the following diagrams applicable to your vehicle, 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 where the module will be located.

Excess wire can be trimmed but please keep in mind that the module may have to be accessed to adjust the shutdown temperature so we suggest leaving enough slack to perform this function.

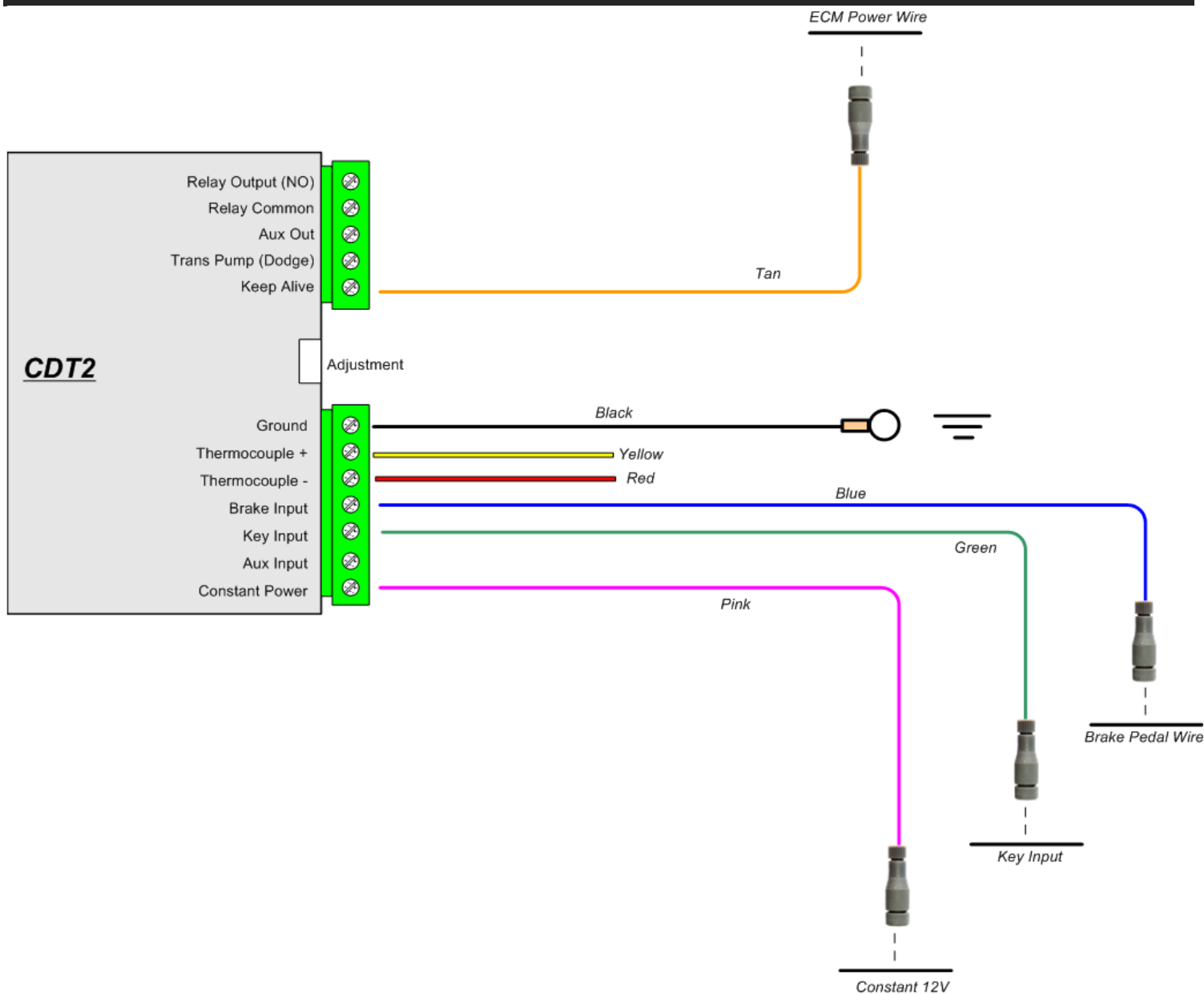
Connect to the appropriate terminals as per the charts and diagrams. Tighten each terminal by turning the terminal screws clockwise until the wire is secure.

When connecting the wires to the module, leave enough slack to so that the module can be accessed to temperature adjustments.

NOTES

Please be advised that when the engine is in cool down mode (CDT2 is active) a number of trouble lights or message center errors maybe displayed. This is completely normal and should not be a concern. The vehicle will function normally once the key is inserted again.

GENERAL WIRING

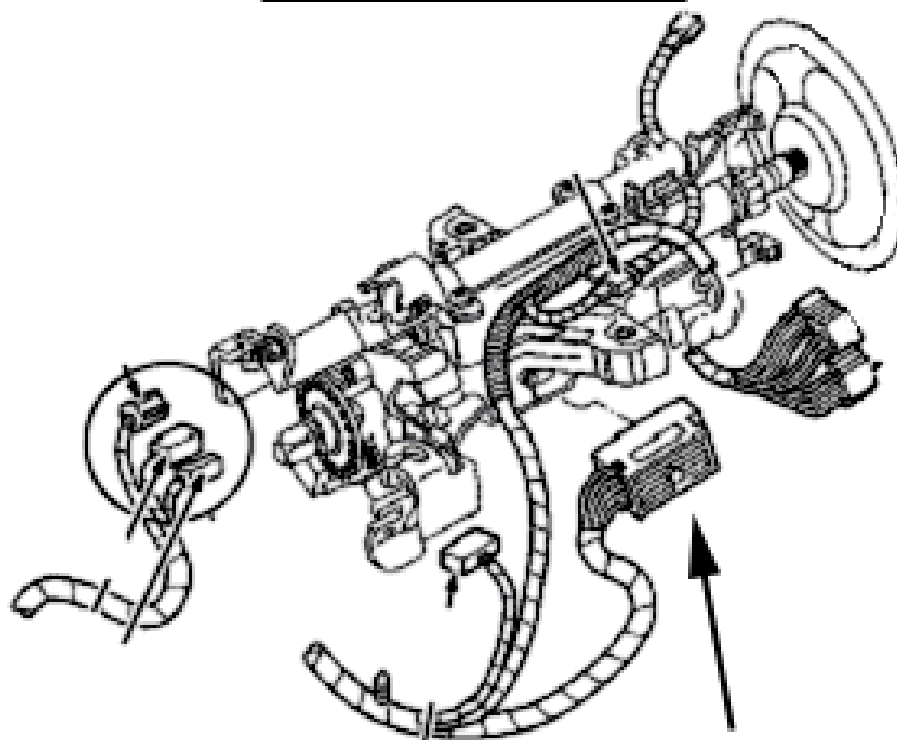
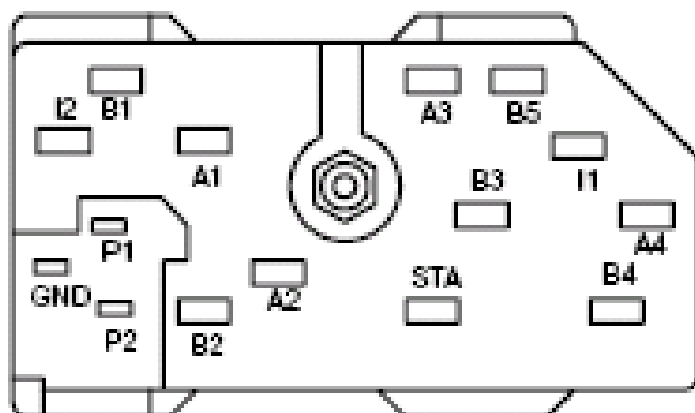
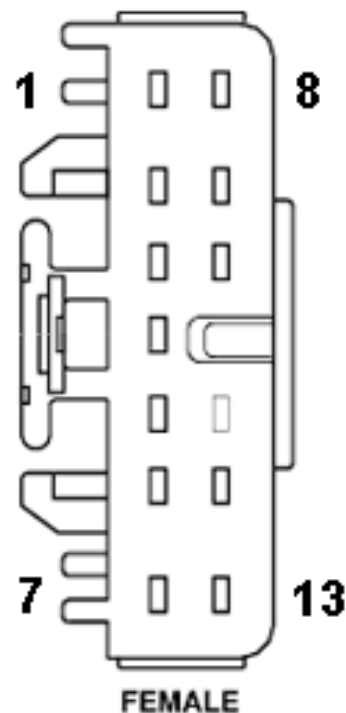


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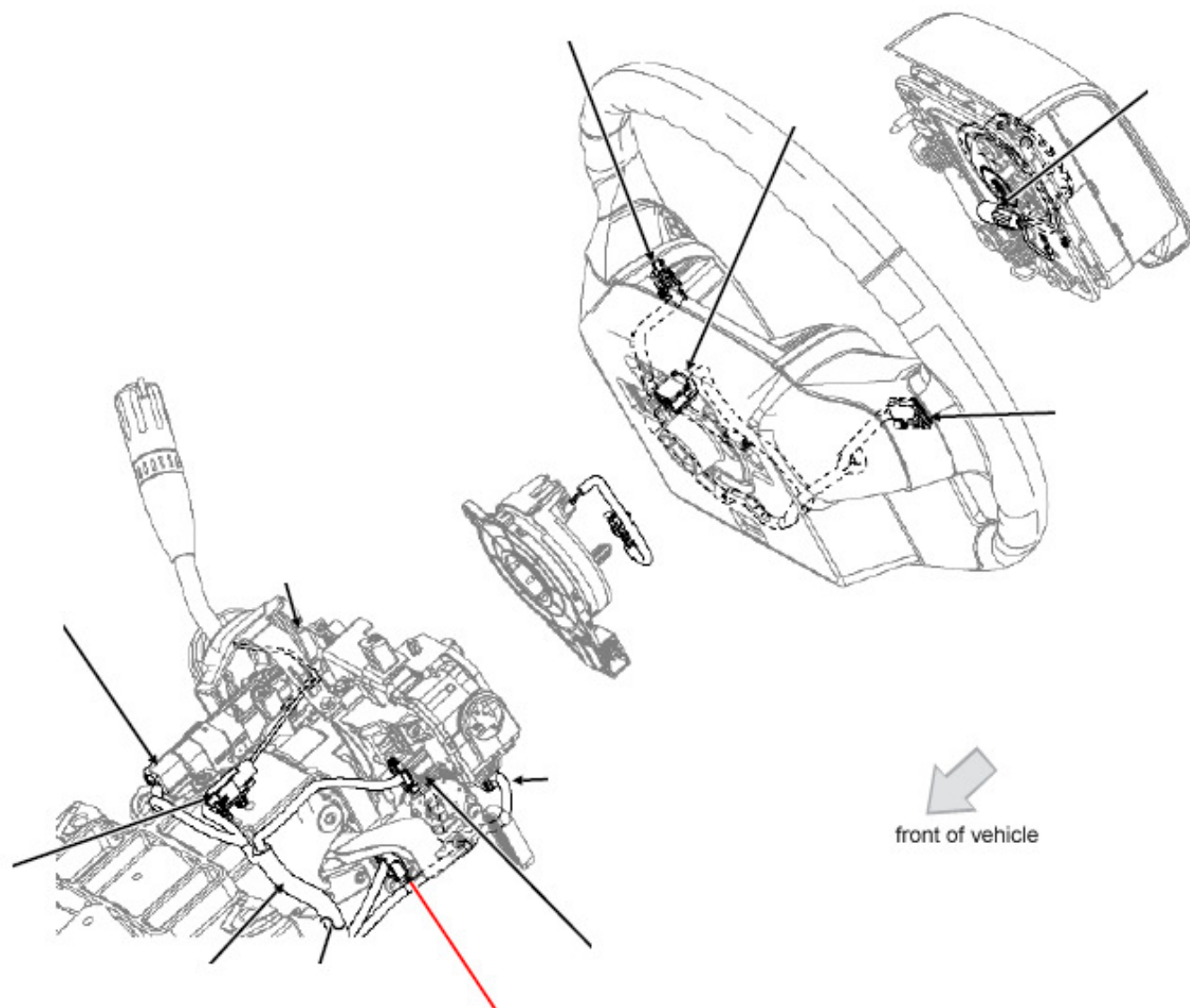
FORD POWERSTROKE WIRING DIAGRAM**Steering Column****Ignition Switch
(11572)****1994-2004 Fords****2005-2007 Fords**

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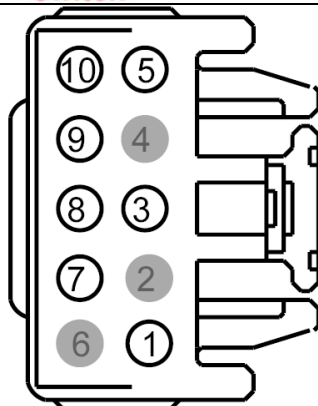
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2008 Fords

**C250
Ignition
switch**



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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	
2003-2007 6.0L		RD/GN	
2007-2008 6.4L		VT/WH	
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
2005-2007 6.0L		RD/BK 1040	13
2007-2008 6.4L		BR/YE or YE/OG	7
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	Ignition Connector C250	WH/YL 1044	I1
2005-2007 6.0L		RD/LG 16	1
2007-2008 6.4L		WH/OG	1
Constant (Pink Wire)			
1994-2003 7.3L	Ignition Switch Harness	YL 37	B1 or B3
2003-2004 6.0L	Ignition Connector C250	YL 37	B1 or B3
2005-2007 6.0L		YL 37	7
2007-2008 6.4L		DB/RD	8

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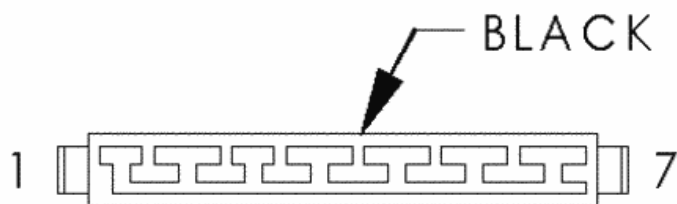
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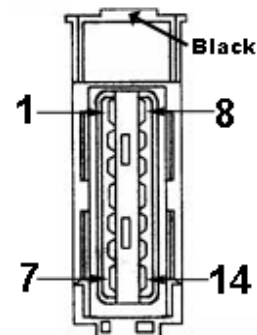
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DODGE CUMMINS WIRING DIAGRAM

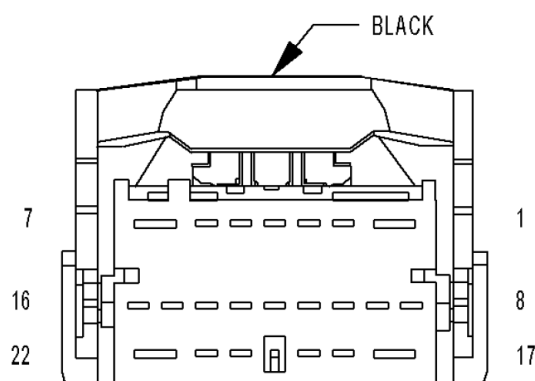
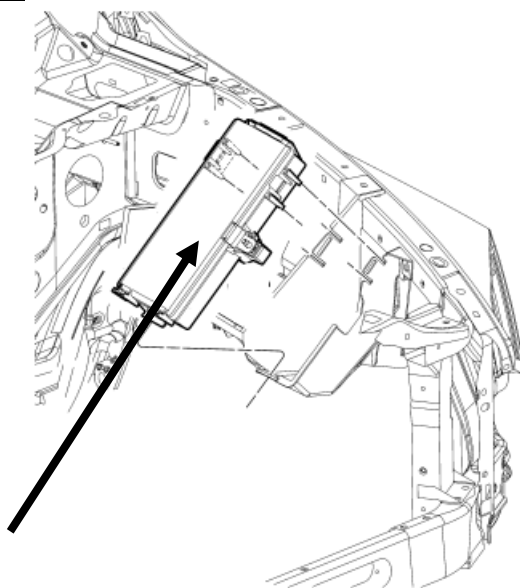
1994-2001 Dodge Ignition Switch (Steering Column)



2002-05 Dodge Ignition Switch (Steering Column)

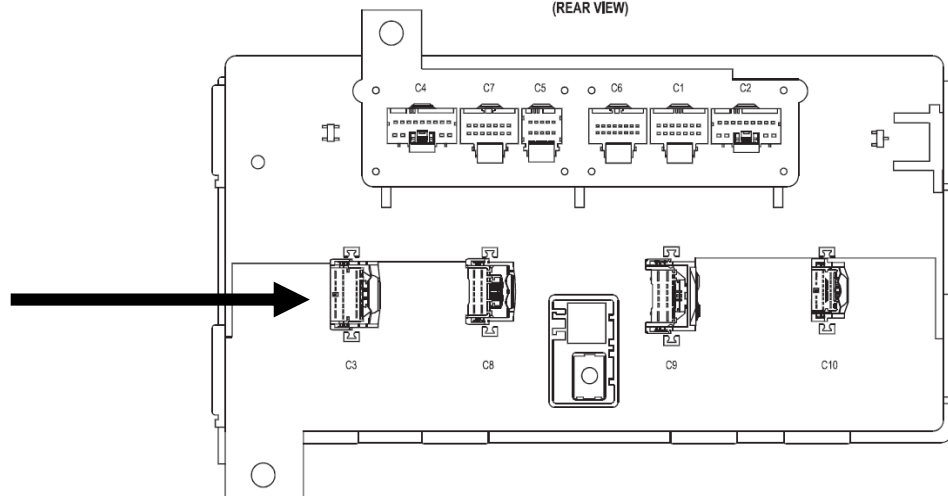


2006-08 Integrate Power Module Location (Engine Compartment Driver's Side)



**MODULE-
TOTALLY
INTEGRATED
POWER C3**

**MODULE-
TOTALLY INTEGRATED POWER
(REAR VIEW)**



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Model	Location	OEM Wire	Pin
Brake Pedal (Blue Wire)			
1994-2001	Brake Pedal Switch	WT/TN L50	5
2002-2008		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
2006-2008	Integrated Power Module (C3)	PK/RD F12	22
Keep Alive (Tan Wire)			
1994-2002	Ignition Switch Harness	DB A21	2
2003		DB A21	3
2004-2005		PK/LG F951	3
2006-2008	Integrated Power Module (C3)	PK/GY F202	15
Constant (Pink Wire)			
1994-2002	Ignition Switch Harness	RD A1	7
2003		RD A1	4
2004-2005		RD A951	4
2006-2008	Integrated Power Module (C3)	RD A209 (10 AWG)	1

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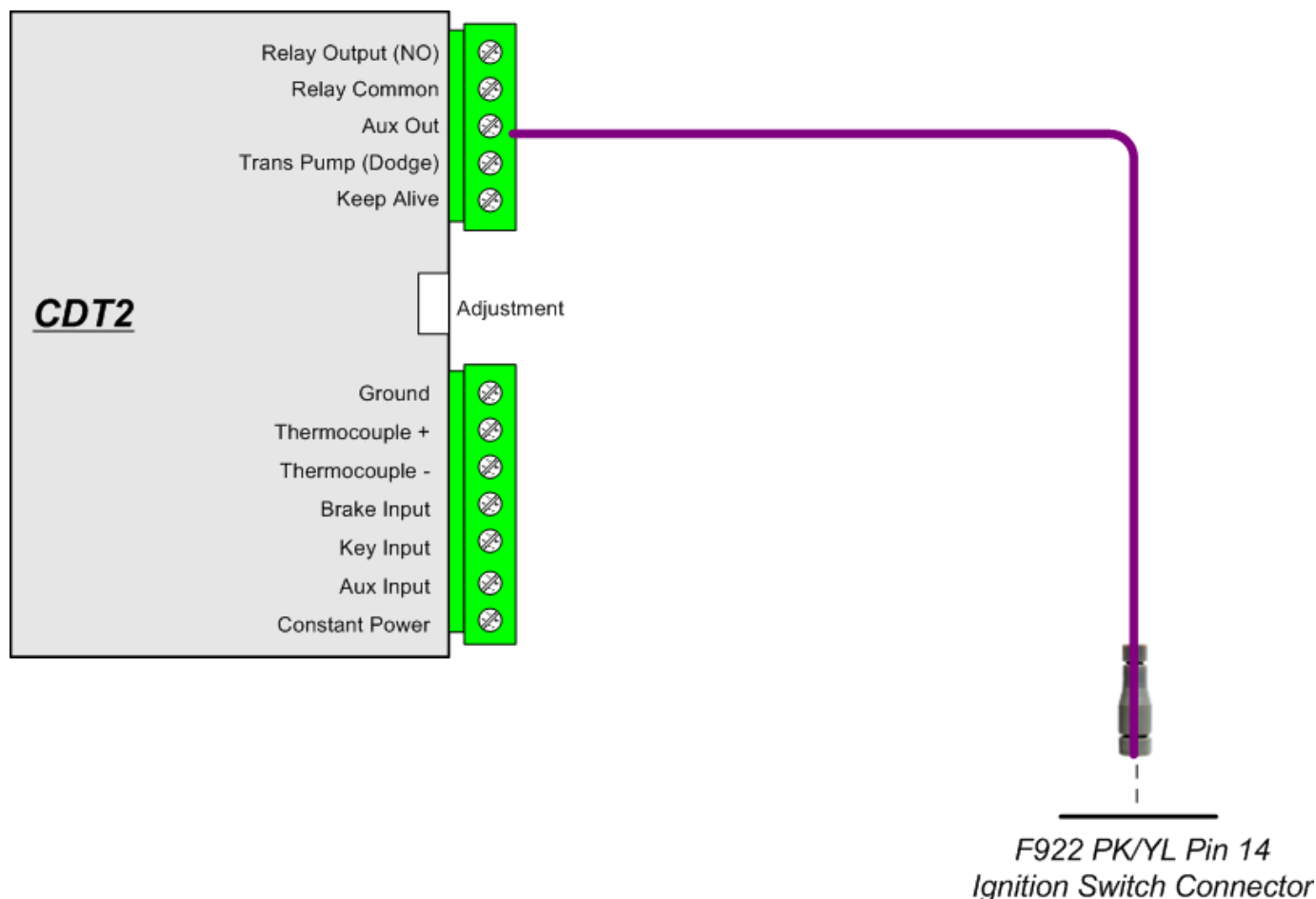
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2004½ - 2005 Dodge Trucks Wastegate Solenoid Power Wiring

Dodge trucks in the year 2004½ & 2005 have a waste gate solenoid that requires power when the CDT2 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.

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 and on the next page for reference.

This step is **not** required for 2006 and newer Dodge trucks.



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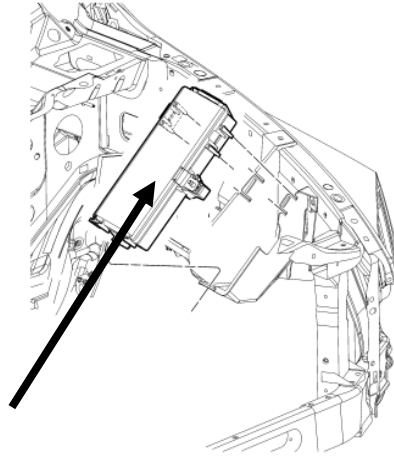
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2006-2008 Dodge Trucks Lift Pump Wiring

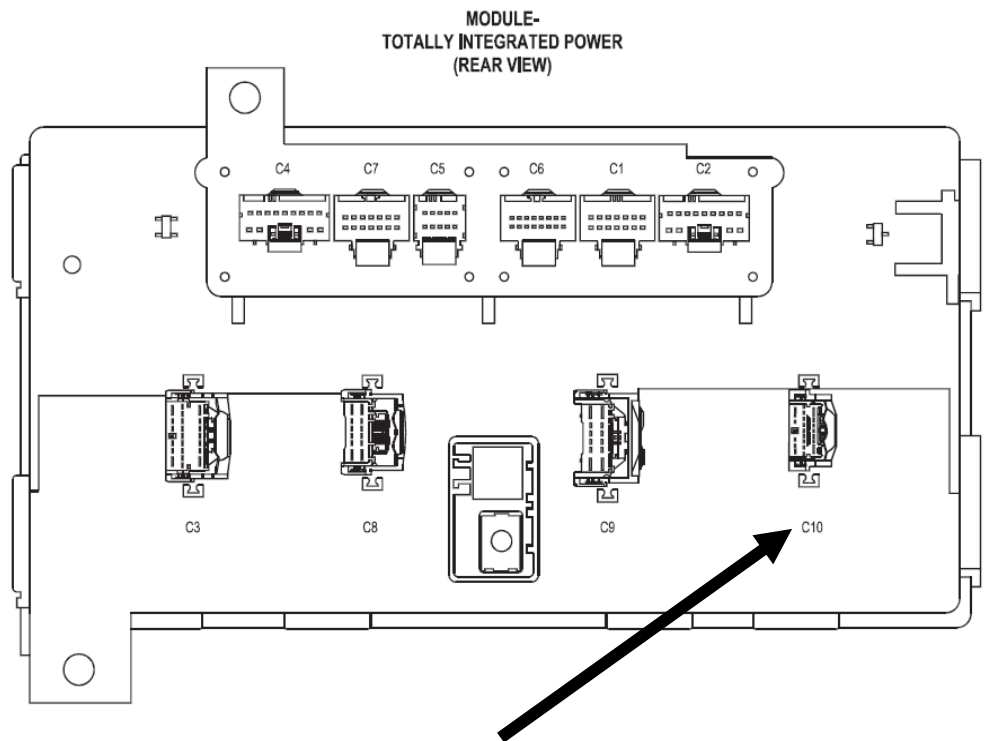
Dodge trucks in the year 2006 power the lift pump via an auxiliary circuit similar to the wastegate in 2004.5-05. Because of this you will need to wire an additional circuit to power your lift pump.

Locate the Integrated Power Module on driver's side of the engine compartment.

Release the two locking clips on the side and flip the Integrated Power Module over.



At the very bottom of the IPM, locate the appropriate connector (C10). Locate **Pin 18 OR/RD** and use the Red T-Tap to tap this wire. Use the supplied wire to route this connection back to the CDT "Trans Pump" output.

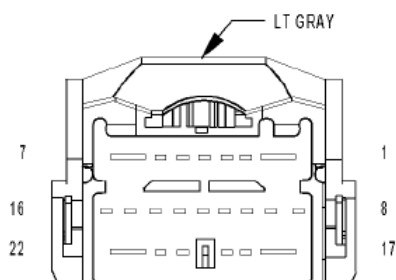


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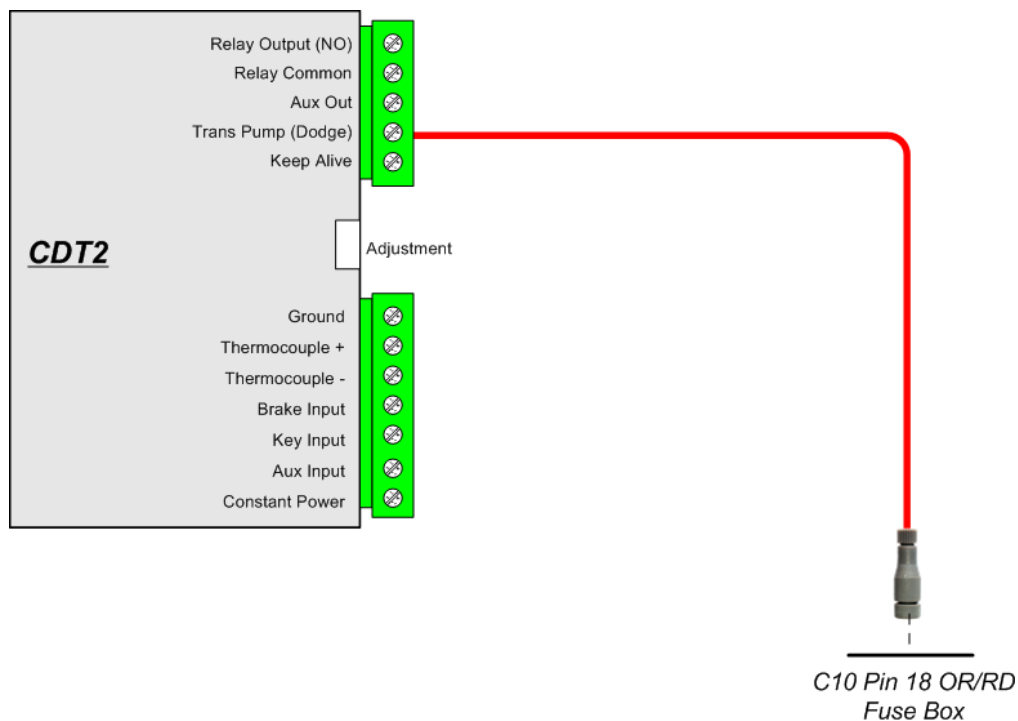
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**MODULE-
TOTALLY
INTEGRATED
POWER C10**

MODULE-TOTALLY INTEGRATED POWER C10 - LT GRAY 22 WAY

CAV	CIRCUIT	FUNCTION
1	K342 16BR/WT (EXCEPT DIESEL)	ASD CONTROL OUTPUT
2	A405 18RD/DB	FUSED B(+)
3	A941 18RD	FUSED B(+)
4	-	-
5	-	-
6	A310 16RD/LB (EXCEPT BASE)	FUSED B(+)
7	C15 14DB/WT (EXCEPT BASE)	REAR WINDOW DEFOGGER CONTROL OUTPUT
8	F12 14PK/RD	FUSED IGNITION SWITCH OUTPUT (RUN-START)
9	T16 16YL/OR (EXCEPT DIESEL M/T)	TRANSMISSION CONTROL OUTPUT
10	-	-
11	X22 18GY/LB	HORN CONTROL OUTPUT
12	W3 14BR/WT	WIPER LOW SPEED CONTROL OUTPUT
13	Z971 18BK	GROUND
14	C16 18DB/GY (EXCEPT BASE)	HEATED MIRROR CONTROL OUTPUT
15	A956 20RD	FUSED B(+)
15	A212 20RD/OR (DIESEL)	FUSED B(+)
16	A917 18RD (SRT)	FUSED B(+)
17	A121 14RD/YL (POWER WAGON)	FUSED B(+)
18	A109 16OR/RD	FUEL PUMP CONTROL OUTPUT
19	X21 18GY/YL	HORN CONTROL OUTPUT
20	Z953 20BK (POWER WAGON)	GROUND
21	T41 20YL/DB (POWER WAGON)	PARK/NEUTRAL POSITION SWITCH SENSE (T41)
22	A400 14TN/RD (TRAILER TOW)	FUSED B(+)



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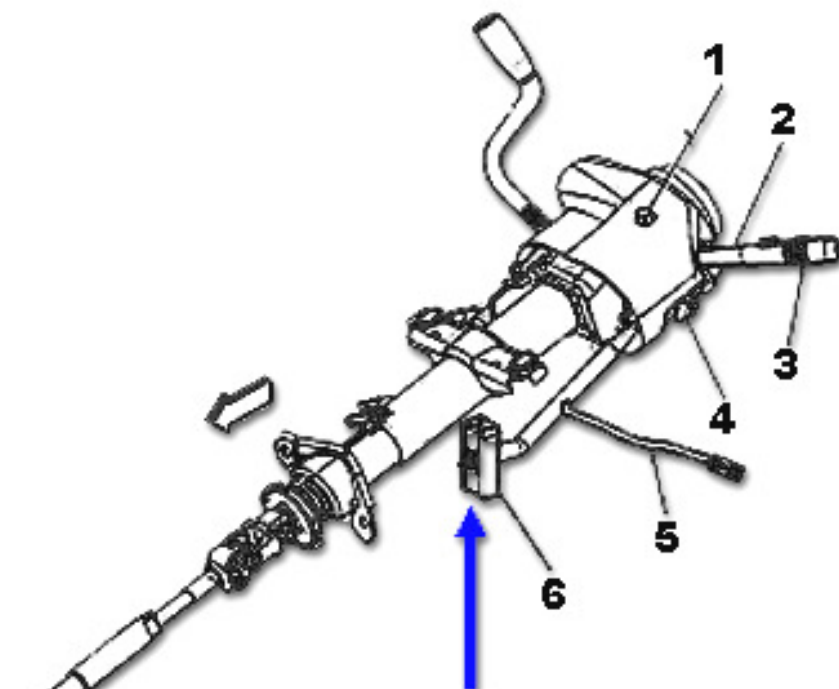
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DURAMAX WIRING DIAGRAMS

Duramax Ignition Connector Location

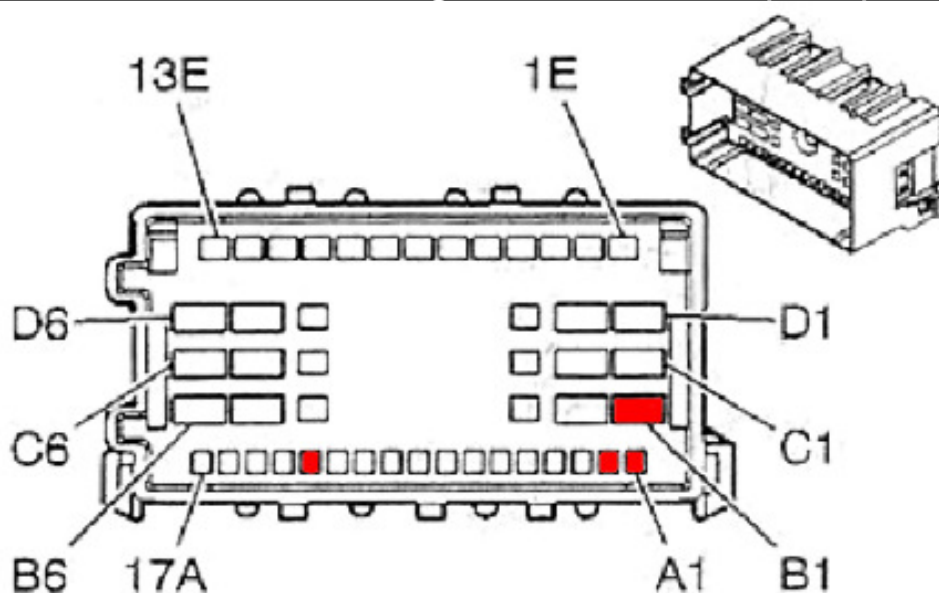


Legend

- 1. Hazard Button
- 2. Multi-Function Lever
- 3. Cruise Control Switches
- 4. Tilt Steering Actuator
- 5. Inflatable Restraint Harness
- 6. 201 Inline Connector

Connect the black wire to a good grounding point.

2001-2002 Duramax Ignition Connector (C201)



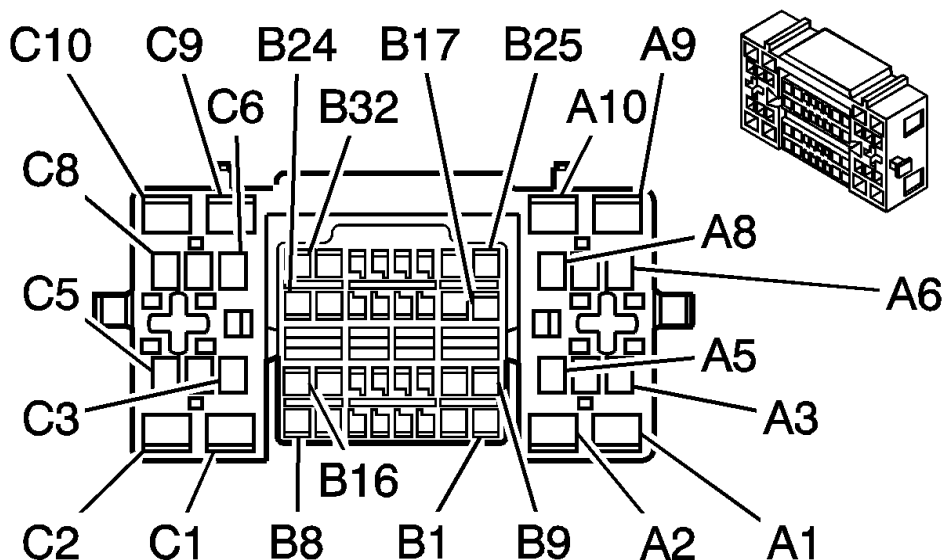
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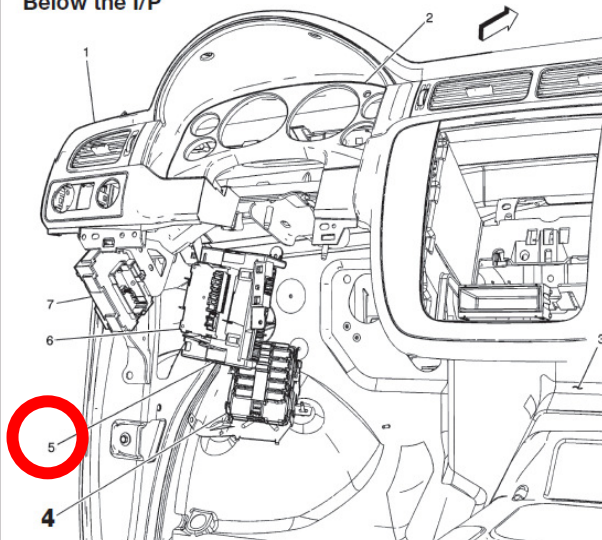
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2003-2007 Duramax Trucks



2008-9 Duramax Trucks

Below the I/P

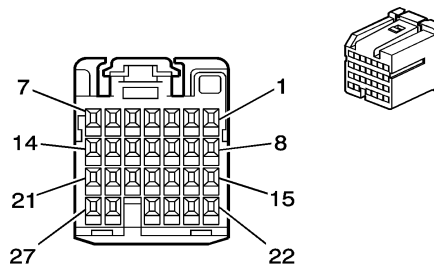


- (1) I/P Trim
- (2) I/P Cluster Trim
- (3) Floor Panel
- (4) Junction Block - Left I/P**
- (5) Body Control Module (BCM)
- (6) Transfer Case Shift Control Module
- (7) Fuse Block - I/P

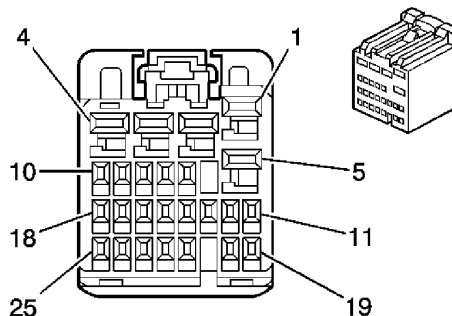
1888353

Locate the BCM (#5).

Connector X1, Light Green in color. Face shown is internal matting face. You will need to access the reverse of this.



Connector X2, White in color. Face shown is internal matting face. You will need to access the reverse of this.



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Model	Location	OEM Wire	Pin
Brake Pedal (Blue Wire)			
2001-2002	Ignition Connector C201	WT 17	A1
2003-2007	Brake Pedal Connector	WT 5689	2
2008-2009	Brake Pedal Connector	Light Blue/White	B
Key (Green Wire)			
2001-2002	Ignition Connector C201	BR 41	A13
2003-2007		BR 41	B18
2008-2009	Body Control Module (BCM) X1	PK 1020	2
Keep Alive (Tan Wire)			
2001-2007	Ignition Connector C201	PK 139	A2
2008-2009	Body Control Module (BCM) X1	PK 3	14
Constant (Pink Wire)			
2001-2002	Ignition Connector C201	RD 242	B1
2003-2007		RD 342	C1
2008-2009	Body Control Module (BCM) X2	Red/White	2

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

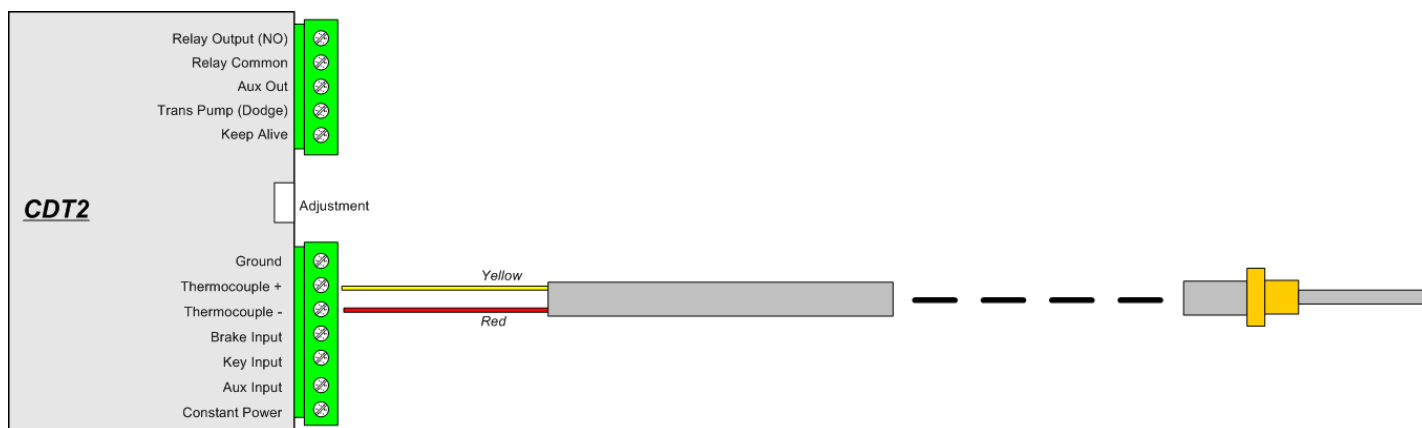
Phone: 604-853-6096 Fax: 604-853-8749 Internet: www.dieselpowerperformance.com

Thermocouple Wiring (Not needed if monitoring with Time vs. Temp)

On most common “K” type thermocouples and wiring, a **yellow** wire is connected to the positive (+) side and a **red** wire is connected to the negative (-) side. The following are three common ways to connect the thermocouple to the CDT2 module. In all cases, the positive side of the thermocouple will be connected to the “Thermocouple +” terminal as indicated on the CDT2 module drawings and the negative side will be connected to the “Thermocouple -” terminal.

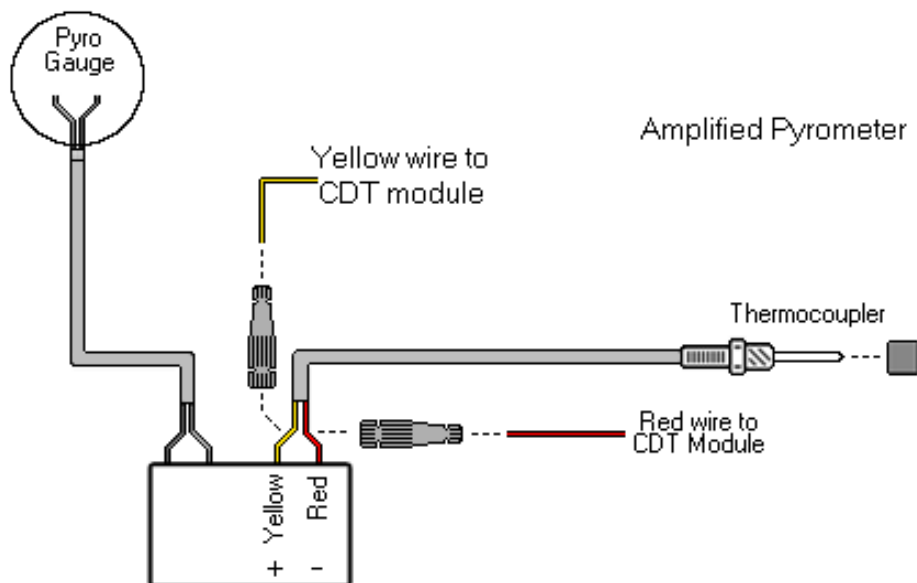
Direct Thermocouple Connection

If there is no pyrometer gauge in the vehicle and a thermocouple is being installed to connect to the CDT2 module, follow this diagram:



Amplified Pyrometer Gauge Kit

Some pyrometer gauge kits utilize a powered amplifier in between the pyrometer gauge head and the thermocouple. If the vehicle has one of these systems installed, use the following diagram:



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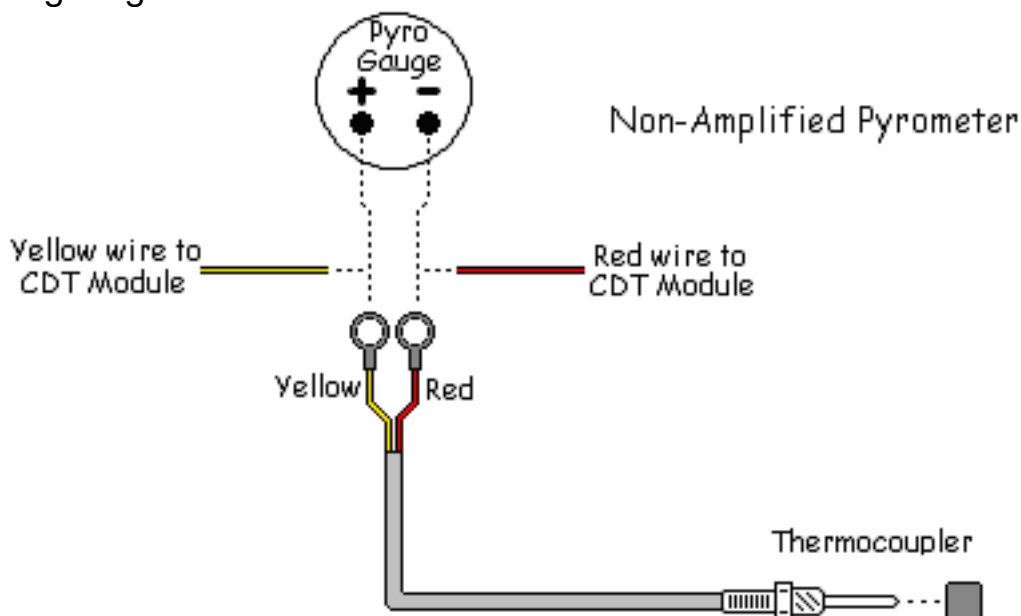
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Conventional Non-Amplified Pyrometer Kit

A conventional pyrometer gauge kit will have the thermocouple connected to the pyrometer gauge head via a lead wire. If the vehicle has one of these systems installed, use the following diagram:

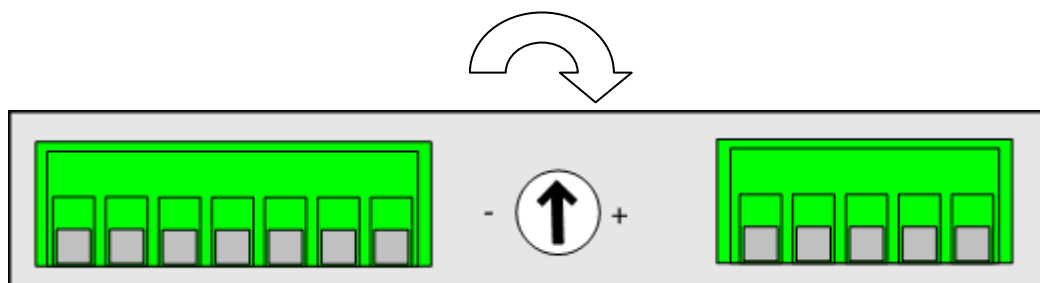


Temperature Adjustment

The shutdown temperature can be set by using a small flat-headed screwdriver to adjust the potentiometer that can be accessed through the hole on the left side of the CDT2 module.

By turning the screw all the way to the right (clockwise), the CDT2 will shutdown at approximately 550°F. By turning the potentiometer all the way counter-clockwise, the CDT2 will shutdown at approximately 250°F. The CDT2 may have to be adjusted a few times until the desired shutdown temperature is achieved.

NOTE: Be careful not to apply too much pressure as the potentiometer is plastic and can break.



Adjustment Range: 250° to 550°

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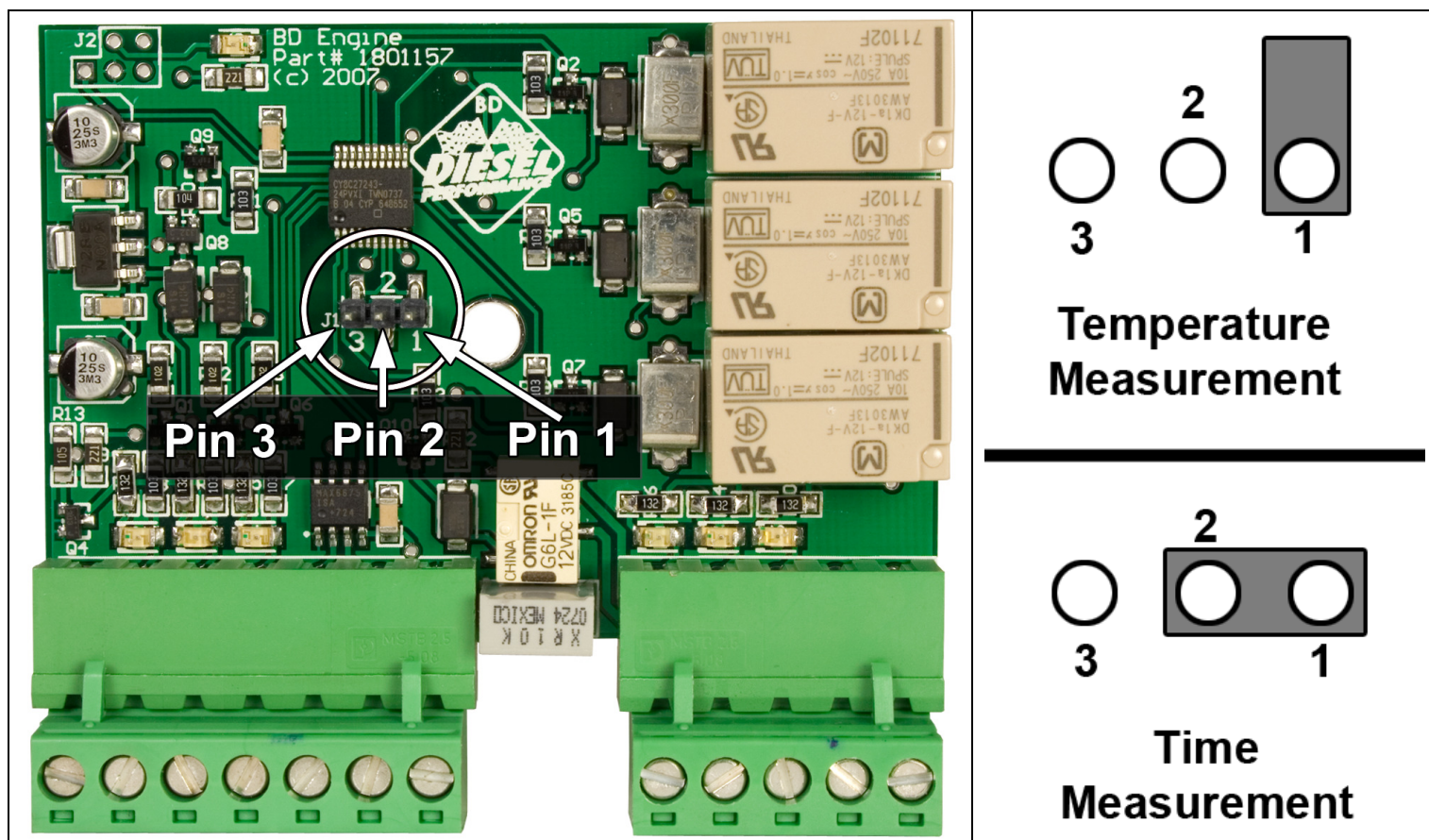
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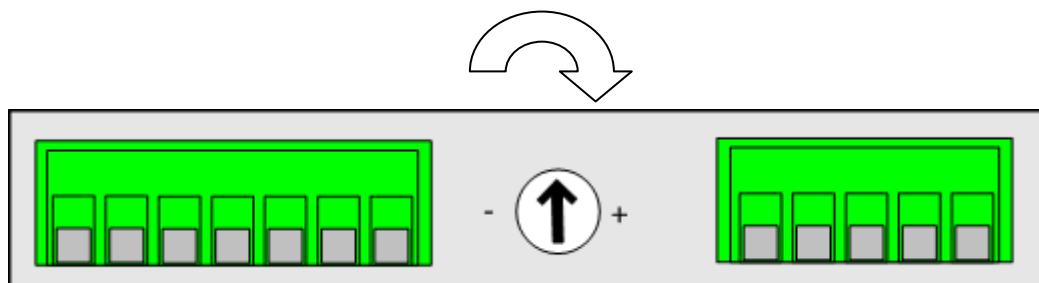
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Time Adjustment

By default the CDT2 is setup to use the temperature as the default shutoff source. The unit can now be configured to use an adjustable time. If you unscrew the unit separating the two enclosure halves (the screw is located under the CDT2 sticker, in the middle of the module), you will see a jumper. You will need to set the jumper so that it connects pins **1 & 2**. See the diagram below for more information.



To adjust the time you can turn the potentiometer on the side of the unit.



Adjustment Range: 60 to 300 seconds

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Communication / Operation Lights

There are a number of new feature that will help troubleshoot problems and indicate correct operation. These LED correspond and are aligned with their corresponding input outputs.

Inputs	LED Operation
Key	Lit when supplied power
Aux. In	Lit when supplied power
Brake Input	Lit when Brake is depressed
Temperature	Lit when temperature is above set point
Outputs	LED Operation
Aux Out	Lit when output powered
Transfer Pump	Lit when output powered
Keep Alive	Lit when output powered

Mounting

Once all the wiring and adjustments have been performed, secure or mount the CDT2 module so that it is not interfering with feet and/or moving parts or near direct heat. We suggest using Velcro to mount to the firewall or zap-strapping to a suitable place such as the back of the X-Monitor module. Being that the CDT2 module is light, it can be suspended if the wiring is secure.

Technical Assistance

If you required technical assistance with the installation or operation of this kit, please contact us at **604-853-6096**, Monday to Friday, 8:00am to 5:00 Pacific Time. We can also be contacted via email at **techline@bd-power.com** or visit our discussion forum site at **<http://forum.bd-power.com/>**.



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Wire Color Glossary

BK	Black	<p>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.</p>
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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