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**2007-2010 (LMM) Models**  
These models require either HP Tuners or EFI Live custom tuning software in order for the vehicle to operate correctly.  
Not compatible with DFP vehicles.

# 2001-10 GMC/Chevy Duramax BD Remote Mount Exhaust Brake

For 2500/3500 trucks equipped with LB7,LLY,LBZ,LMM Engines

Part Number	Application	
<b>1024310</b>	LB7/LLY / LBZ / LMM	Duramax with 3.5" Stock Exhaust, Single Alternator
<b>1024311</b>	LB7/ LLY / LBZ / LMM	Duramax with 4.0" factory or Aftermarket Exhaust, Single Alternator

Serial # \_\_\_\_\_

Date Purchased \_\_\_\_\_

Purchased from \_\_\_\_\_

Installed by \_\_\_\_\_

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

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# Kit Contents

## DURAMAX EXHAUST BRAKE BASE KIT

Every kit takes these components – specialty components on tables below.

<b>1127038-A</b>		<b>1220410</b>		<b>1321018</b>	
					
Valve Assembly		Tubing Plastic 1/4\"		Control Kit	
Qty : 1		Qty : 2		Qty : 1	
<b>1220112</b>	<b>1300529</b>	<b>1459140</b>	<b>1100404</b>		
					
Tubing Kit Duramax Exhaust Brake	Self Tap 8 X 1/2\"	Tube Clamp 5/8\"	4.0\" Marmon exhaust clamp		
Qty : 1	Qty : 1	Qty : 2	Qty : 2		
<b>1030118-D</b>			<b>1330418-D</b>		
					
Duramax compressor pump kit			Regulator & Pump Wiring Assembly		
Qty : 1			Qty : 1		

<b>1024310 – Duramax 3.5” Stock Exhaust</b>	
<b>1100350</b>	<b>1100735</b>
	
3.5” Exhaust pipe adapter Qty : 2	3.5” Exhaust seal clamp Qty : 1

<b>1024311 – Duramax 4.0” Factory or Aftermarket Exhaust</b>	
<b>1100400</b>	<b>1100740</b>
	
4.0” Exhaust pipe adapter Qty : 2	4.0” Exhaust seal clamp Qty : 1

**Recommended Related Products**

BD Tap Shifter kits add gear selection control to 2001-2005 GM pickups with Allison transmissions, which allows the driver to maximize braking capabilities.

2001 - 2002 Tap Shifter Kit	1031360
2003 - 2005 Tap Shifter Kit	1031361



## Welcome

Thank you for purchasing a BD Exhaust Brake. Your kit should have the items listed on the previous page for your installation. This manual is divided into different areas to assist you with your installation and operation of your braking unit. We strongly suggest that you write down the kit and serial numbers of your unit in the spaces provided and retain this manual for any future reference.

## Pre-Installation

Ensure all of the parts listed in the Kit Contents section have been included with your kit before proceeding with installation. Read the entire installation section before beginning. See special tuning requirements for LMM vehicles below.

## Special Tools Required

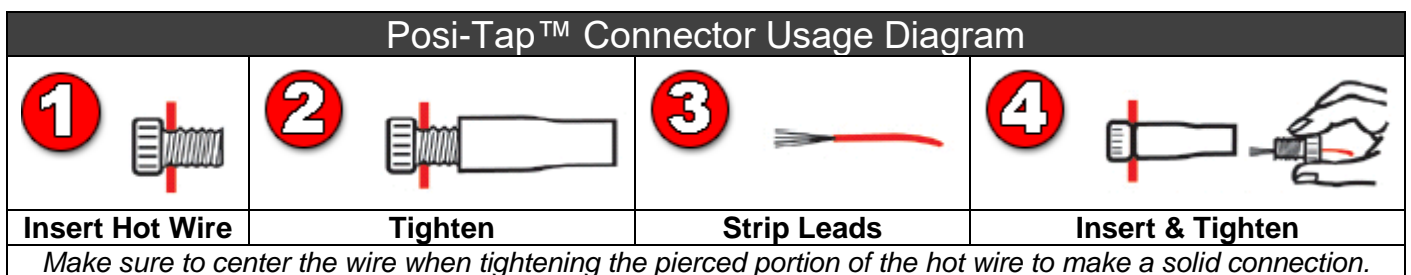
- Measuring tape or ruler
- Drill with 1/8" bit and Unibit
- Sawsall or hacksaw
- Wire Crimping Pliers
- Test light
- Welder

## 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 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.

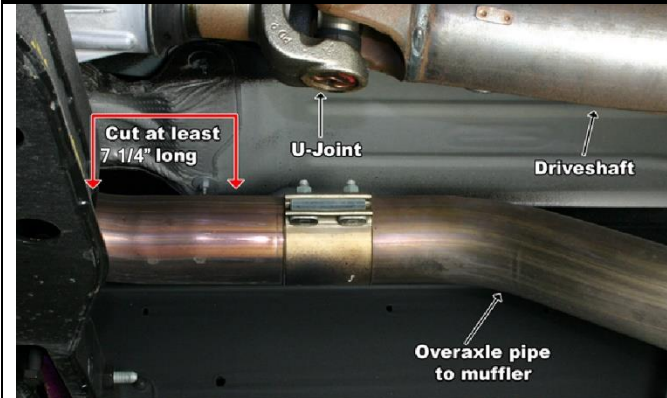


**The ground terminals of the vehicle's batteries should be disconnected before performing any piercing/posi-tapping onto any ECM/PCM wire.**

# Brake Valve Installation

Raise Vehicle. Locate a straight section of pipe at least 10" long, keeping as close to the engine as possible. Refer to pictures below.

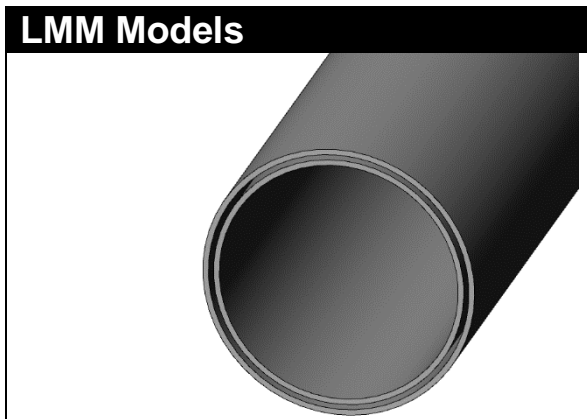
## LB7 / LLY / LBZ Models



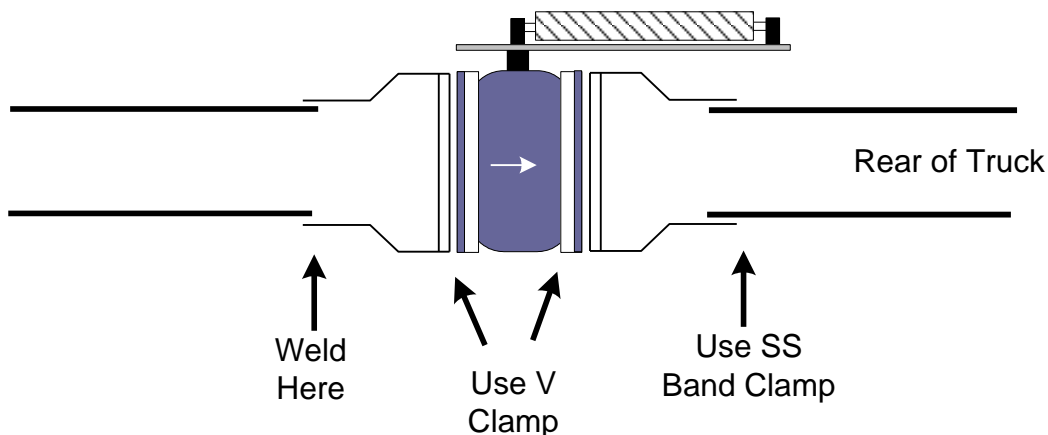
## LMM Models



Before cutting the pipe, make sure the exhaust brake bracket will clear the cross member, then remove a 7-1/4" section of pipe with a sawsall or cutoff tool. On LMM models the exhaust pipe will be double walled. Weld both sections together on both the front and back sides of the exhaust. (Not compatible with DPF vehicles).

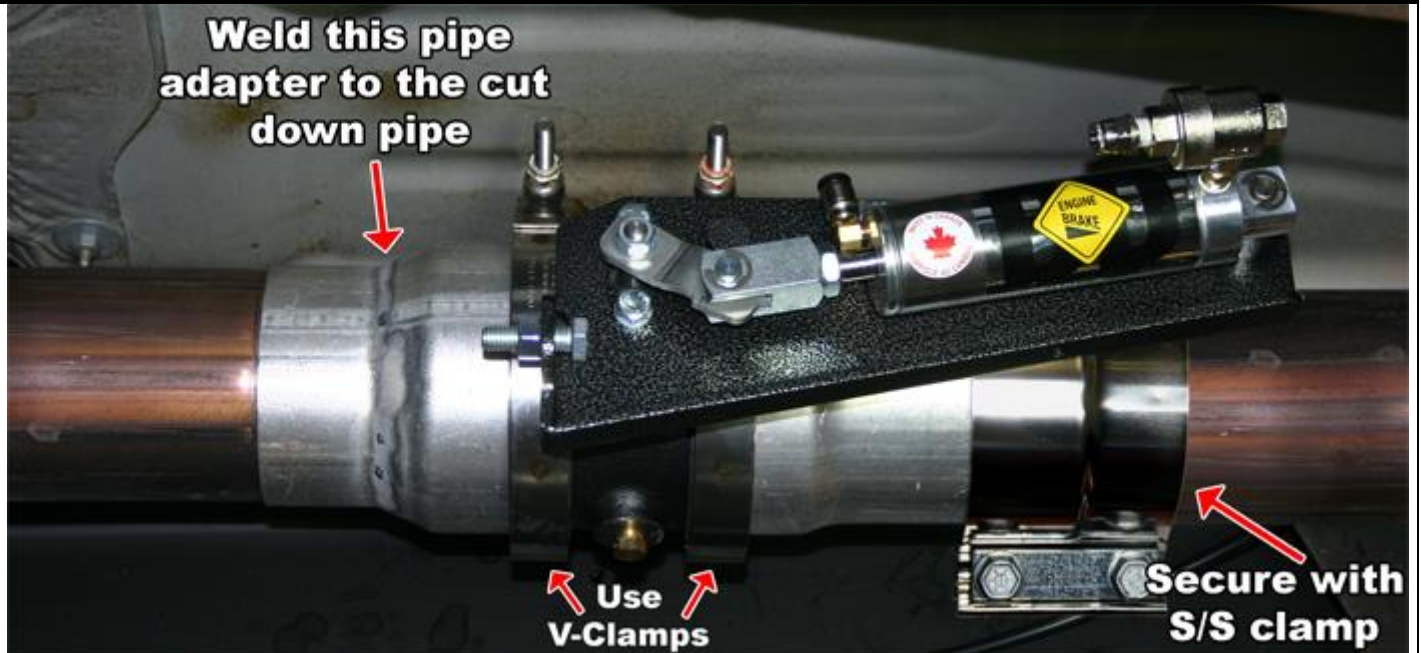


Slide the supplied pipe adapter flanges over each side of the cut exhaust. The flange closest to the front of the vehicle will need to be welded. A good, clean weld is needed to seal the high backpressure that the exhaust brake will create. Mount the rear flange with the supplied stainless band clamp.

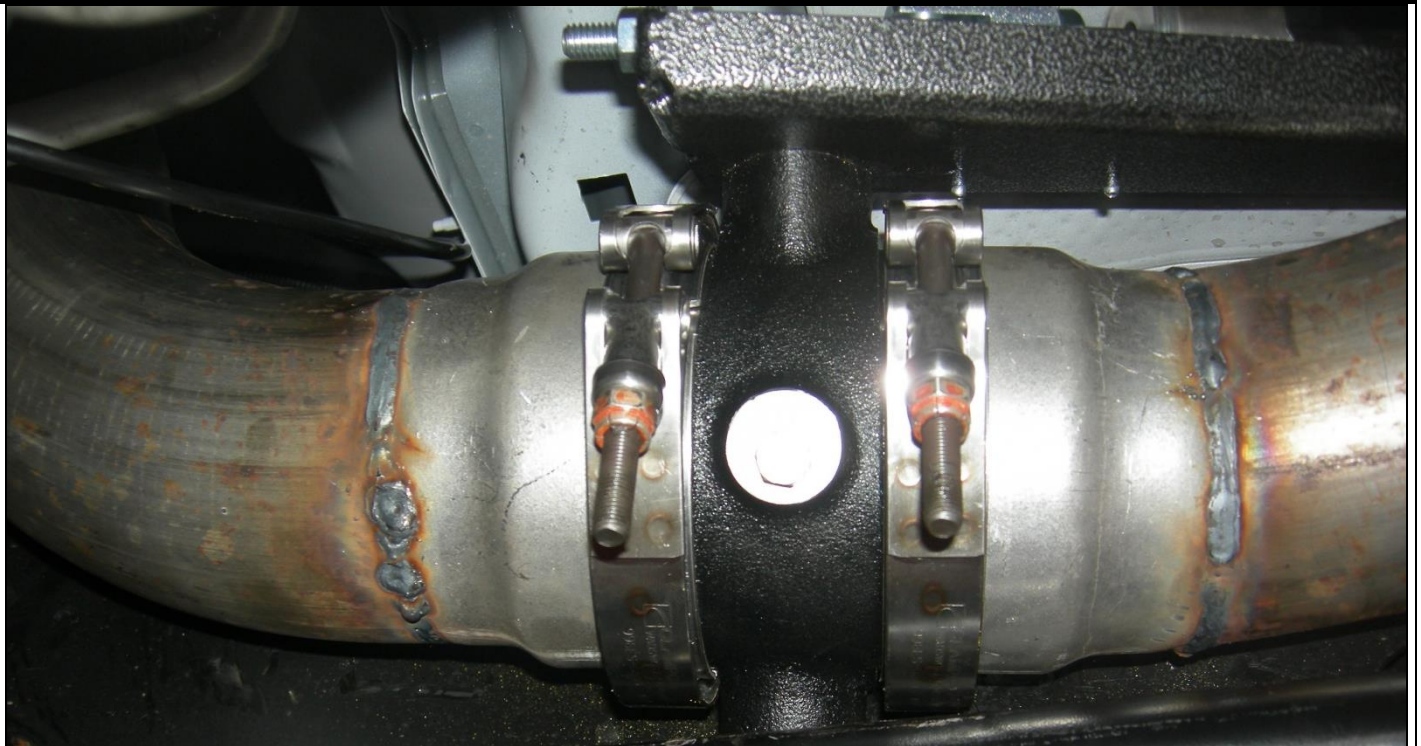


Install the valve assembly in between the two flanges using the two V-band clamps. There is an arrow cast into the exhaust brake indicating direction of exhaust flow. This arrow should be pointing towards the rear of the vehicle.

### LB7 / LLY / LBZ Models



### LMM Models



## **IMPORTANT NOTES ON VALVE INSTALLATION**



*THE VALVE ACTUATING CYLINDER MUST BE POSITIONED TO THE MIDDLE / INSIDE OF THE VEHICLE.*

*WHISTLING FROM THE EXHAUST BRAKE WHILE IT'S ON INDICATES AN EXHAUST LEAK.*

### ***Air Supply***

The air tube assembly in this kit has one 1/8" supply and one 1/4" vent tube.

Connect the 1/8" tube to the quick-connect coupler on the quick release valve on the brake air cylinder. Connect the 1/4" tube to the vent line on the other end of the air cylinder.

Route the tube assembly over the driveshaft/transfer case to the driver's side frame rail. Secure the tube assembly to the vehicle body using the supplied cable clamps and self-tapping screws. A 1/8" pilot hole must be drilled into the cross support for the clamp screws.



**CARE MUST BE TAKEN NOT TO KINK THE PLASTIC HOSE OR ROUTE IT NEAR A HEAT SOURCE.**

**NOTE:** To remove the plastic hose from the quick-connect coupler, push the outer ring toward the fitting and pull the hose out.



## **Main Wiring Harness Installation**

Remove the dashboard bezel by pulling backwards on the corners of the bezel. Tilting the steering wheel down and moving the shift lever to 1<sup>st</sup> will make it easier to remove the bezel.



Remove the knee bolster by removing the two screws on the bottom, then pull it outwards to release the clips at the top.



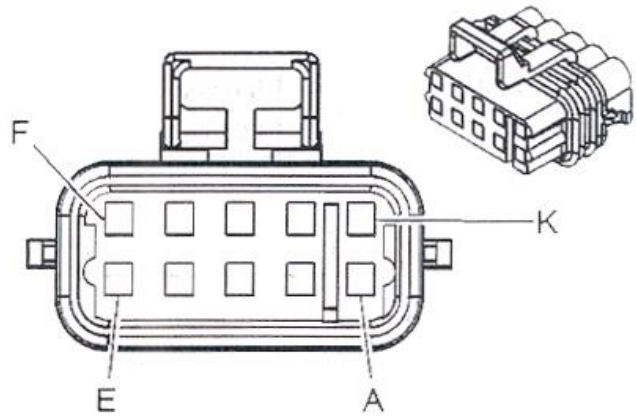
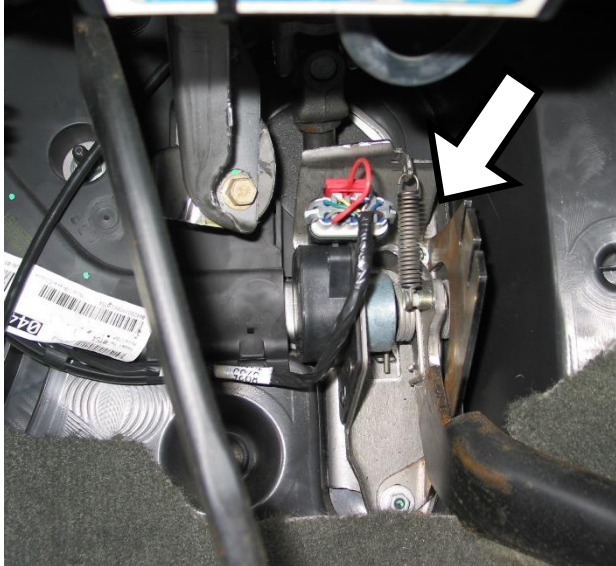
Find a suitable mounting location for the electronic brake control module. Use double sided tape or zap straps to secure the module below the dashboard.

## **APPS Installation**

Locate the accelerator pedal position sensor wiring connector on top of the pedal. Using the supplied red Posi-Tap, connect the supplied dark blue wire to the accelerator pedal sensor circuit. Route the blue wire to the brake control module and connect it to the pin labeled "TPS In".

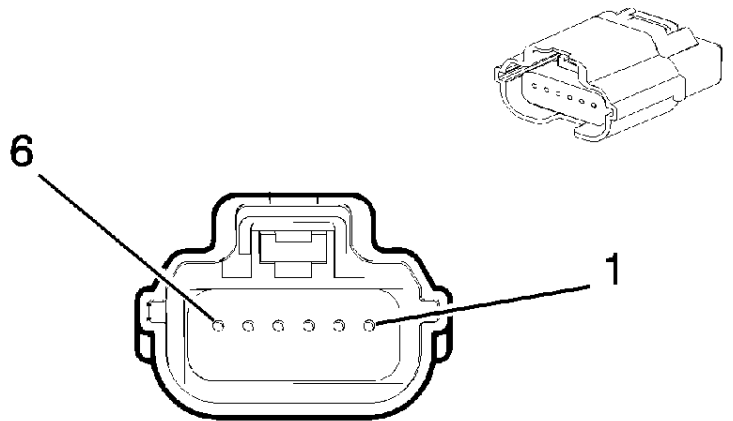
Refer to information below for specific OE wire color.

**LB7 / LLY Models (2001-2005)**



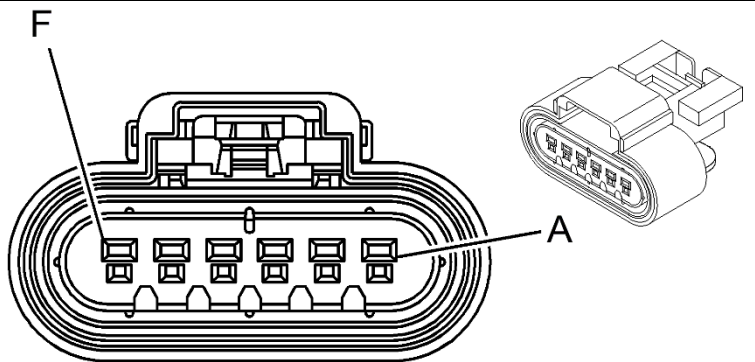
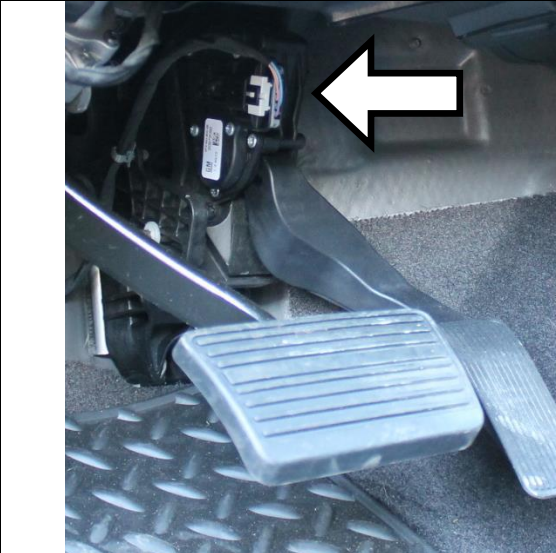
**APPS Sensor Signal 1  
Pin F (Dark Blue wire – Circuit 1161)**

**LBZ Models (2006-2007)**



**APPS Sensor Signal 1  
Pin 5 (Dark Blue wire – Circuit 1161)**

**LMM Models (2008-2010)**



**APPS Sensor Signal 1  
Pin E (Dark Blue wire – Circuit 1161)**

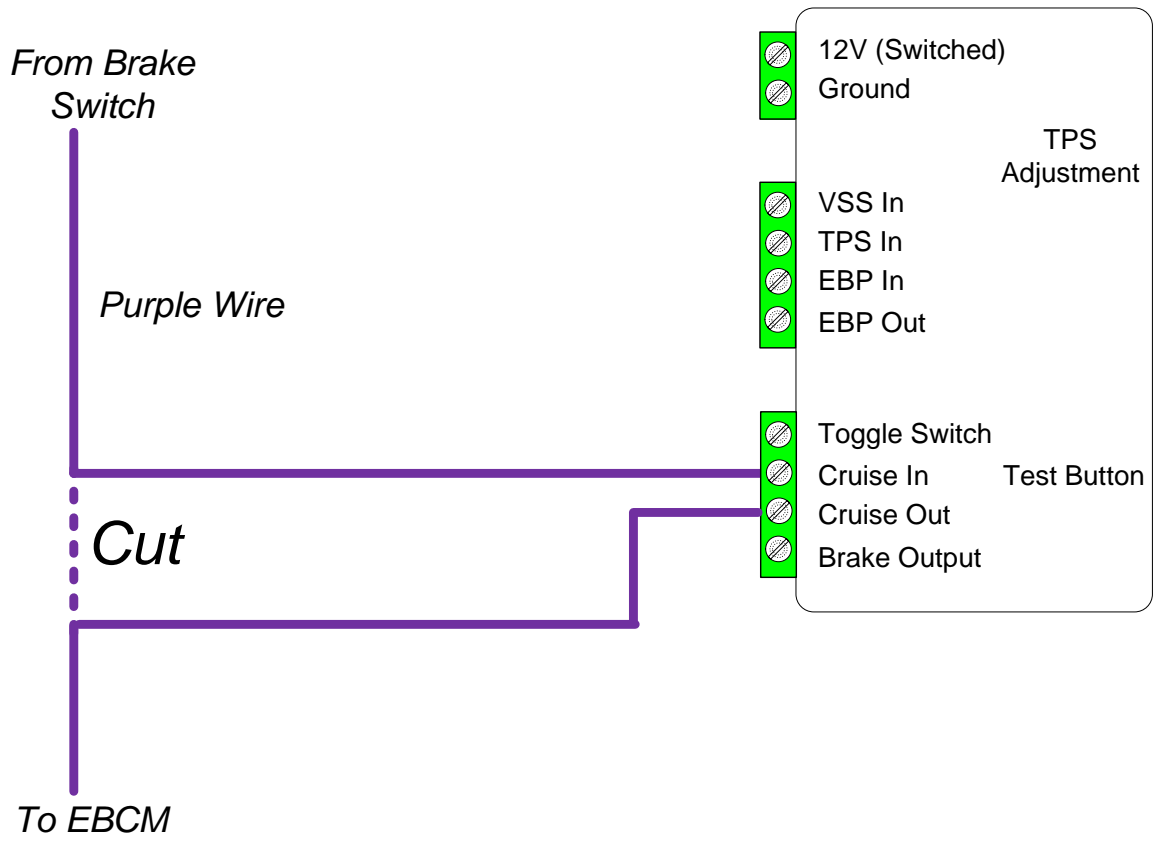
# Cruise Control

## LB7/LLY Vehicles

Under the dash, by the brake pedal, locate the brake light switch and the **PURPLE** wire coming from it. With the key turned on, test the purple wire to ensure it is the correct one. This wire will have power when the key is on and power will go OFF when the brake pedal is applied.

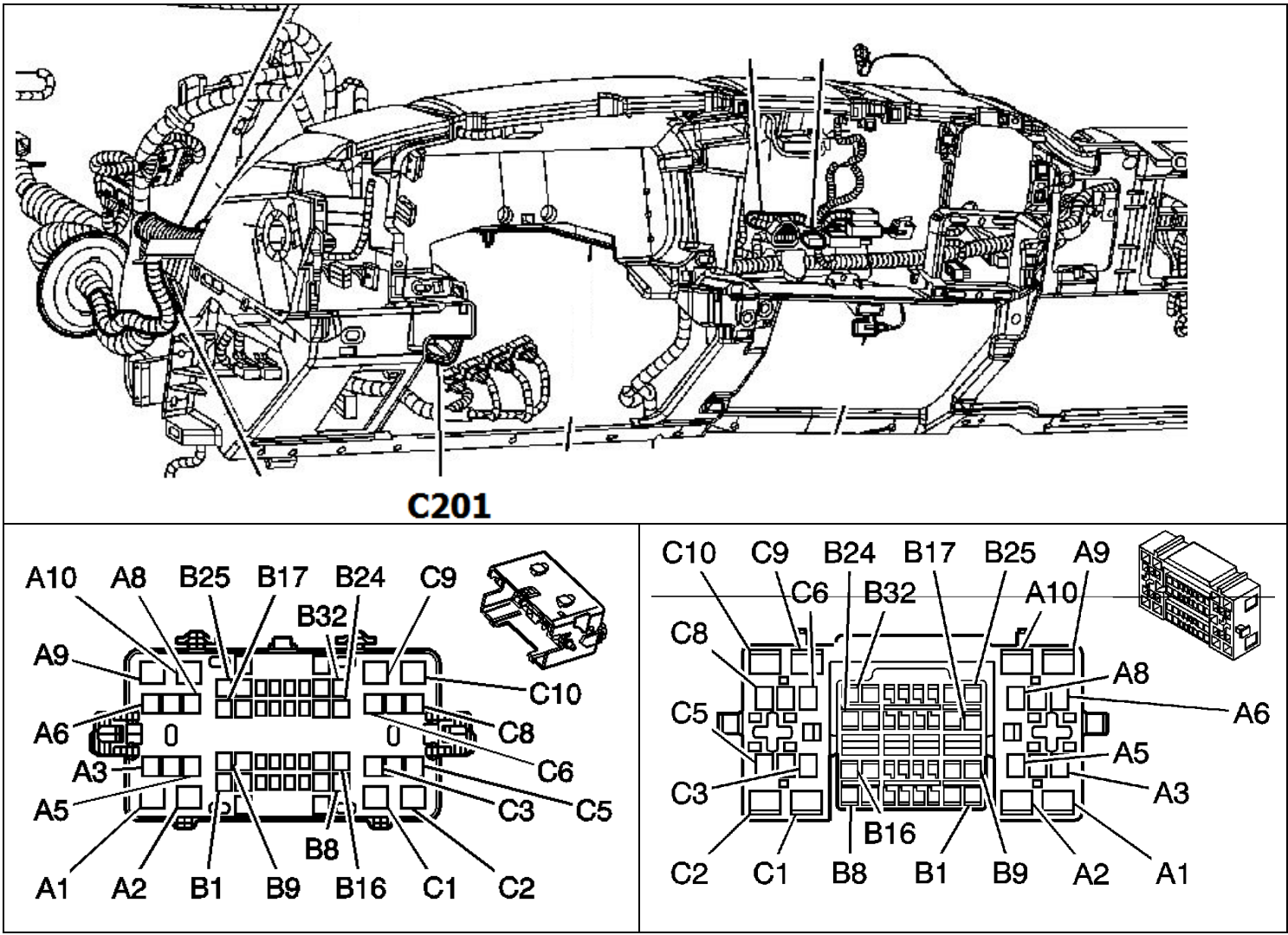
Strip away some of the wire loom to expose the wire about 6-8" (a good working length) away from the brake switch.

Cut the Purple wire at this point and strip 1/4" insulation off each end then slip a piece of shrink tubing (supplied) over each end and up out of the way at this time. Insert one end of the cut wire into the Brake Controller input marked **CRUISE IN** and the other cut end into the **CRUISE OUT** input. Extra wire has been provided to ease the installation, also shrink tubing has been added to the kit to seal all connections.



### LBZ Vehicles

You will need to remove the dash cover panel below the steering wheel. Once removed there is a steel shield that also needs to be removed to reach connector C201.



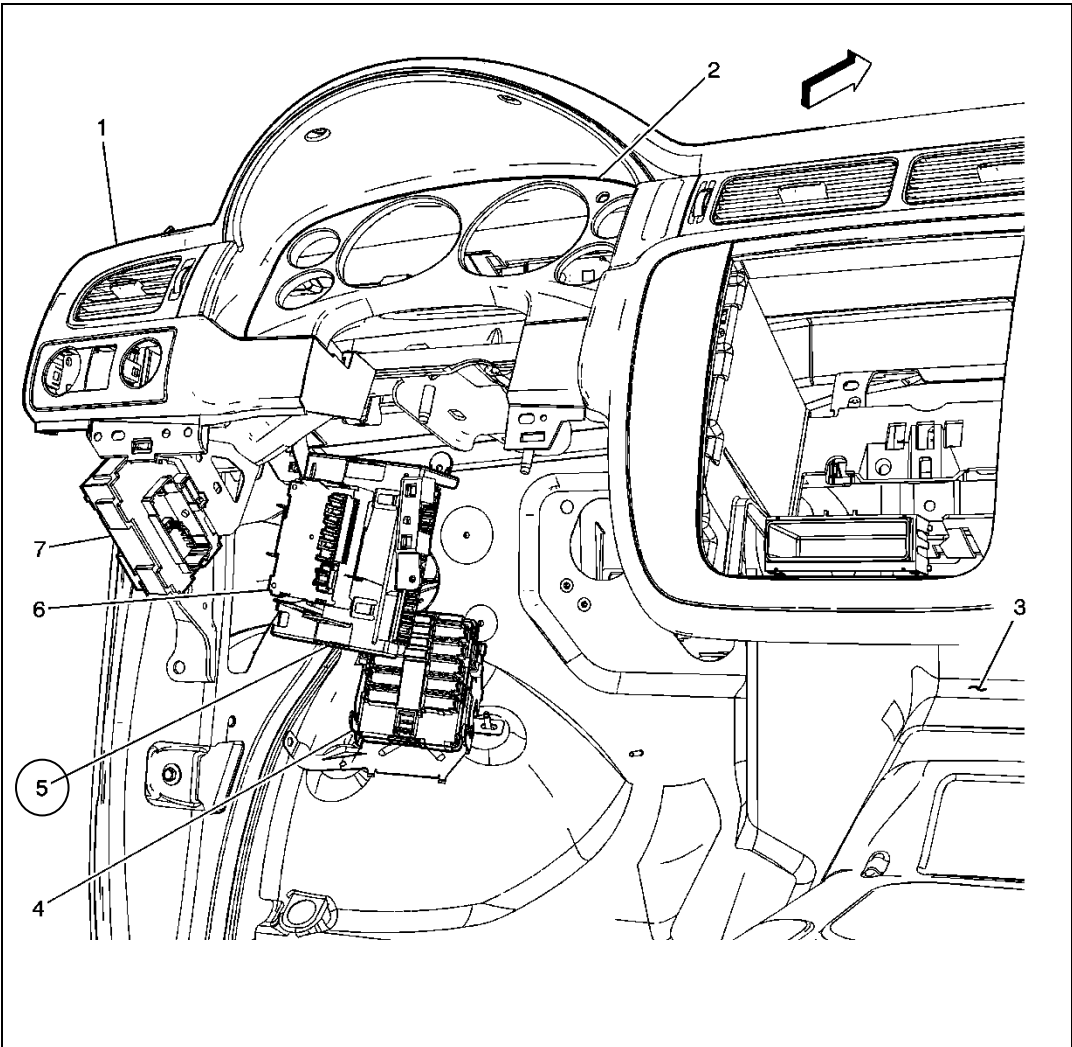
Pin	Color	Use
B31	Lt Green	
B32	Grey or GY/WHT	<b>Cruise Wire</b>
C9	Yellow	

Cut the **Cruise** wire before the connector and strip 1/4" insulation off of each end. Slip a piece of shrink tubing (supplied) over each end and up out of the way for now.

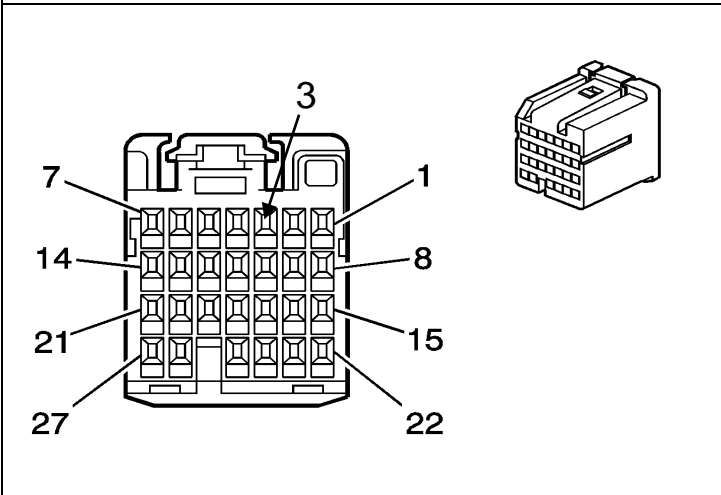
Insert one end of the cut wire into the Brake controller input marked **CRUISE IN** and the other cut end into the **CRUISE OUT** input. Extra wire has been provided to complete the installation, and shrink tubing has been added to the kit to seal all connections.

### LMM Vehicles

You will need to remove the dash cover panel below the steering wheel. Once removed you will need to locate the **Body Control Module (BCM)**.



Locate the Body Control Module (BCM) underneath the dash (#5).



Locate the X1 connector, there will be 7 connectors connected to the BCM. The X1 connector will be a 27 pin connector that is Light Green in color. Connect to Pin #3.

*Picture shown is the internal mating face of the connector.*

Pin #	Wire Color	Function
2	PK/BK	
3	GY	Cruise Wire
4	WH	

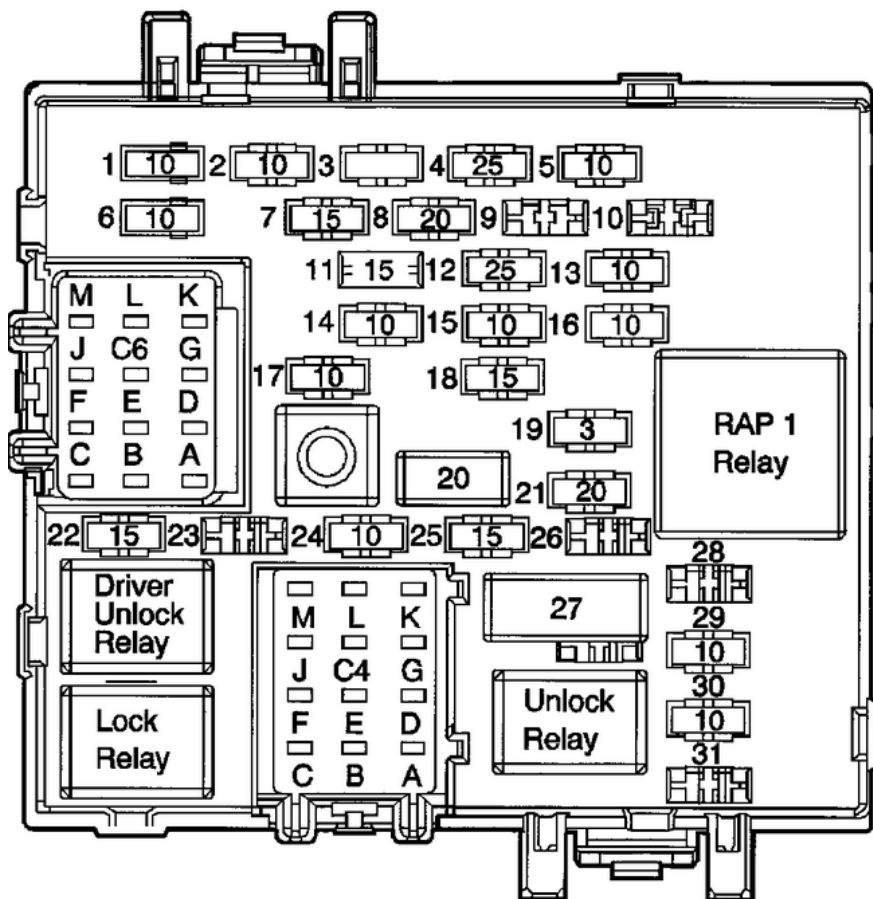
Cut the **Cruise** wire before the connector and strip 1/4" insulation off of each end. Slip a piece of shrink tubing (supplied) over each end and up out of the way for now.

Insert one end of the cut wire into the Brake controller input marked **CRUISE IN** and the other cut end into the **CRUISE OUT** input. Extra wire has been provided to complete the installation, and shrink tubing has been added to the kit to seal all connections.

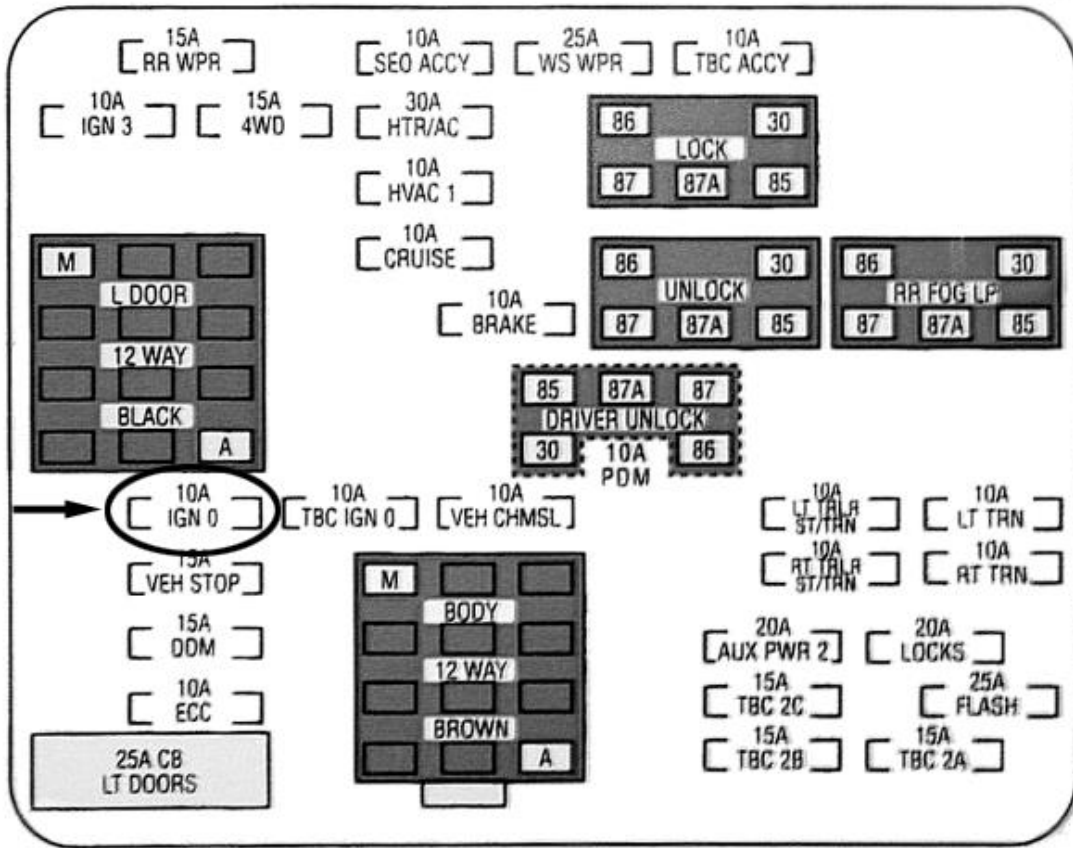
## 12 Volt Power

Locate a switched power supply on the Instrument fuse panel (this is located on the left side of the instrument panel when you open the driver's door) then install the brass fuse tap provided onto the HOT side of fuse which will be the side with power to it when the fuse is removed and key on.

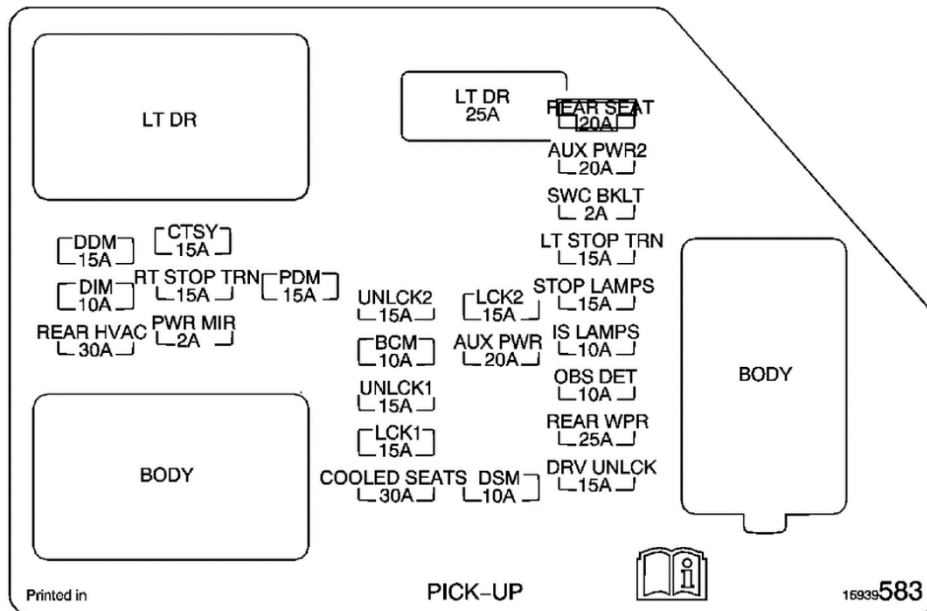
Run this switched power source to the 12 Volt Power input on the brake controller module. Master wiring diagrams are located on pages 22-23 if you require assistance.



**2001-2002 Models  
Use Fuse #1**



**2003-2007 Models  
Use Fuse "IGN 0"**



**2008-2010 Models  
Use Fuse "BCM"**

Install the ground connection to the brake controller by selecting one of the mounting bolts or nuts that are fastened to the firewall. Be sure that it is a good solid clean ground.

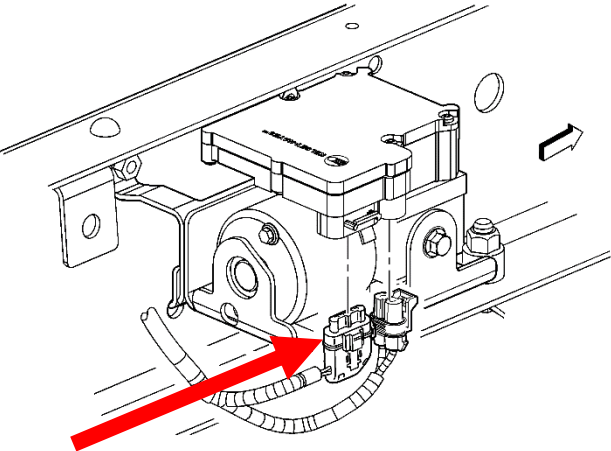
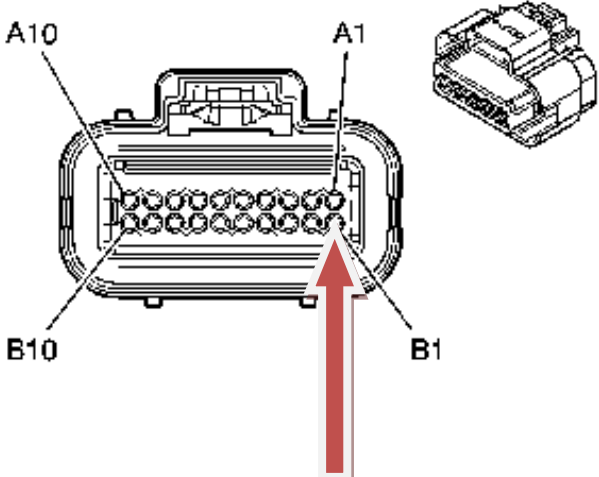
## Vehicle Speed Input

Due to the Duramax engine's EGR being active during idle and low vehicle speeds, it is necessary to eliminate the brake activation during these conditions.

You will need to locate the **EBCM** (*Electronic Brake Controller Module*) on ABS equipped vehicles. The **EBCM** is mounted to the inside of the driver's frame rail, just before the rear torsion bar adjustment for the front driver's side suspension.

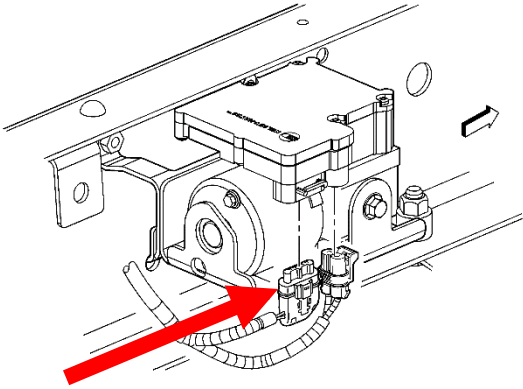
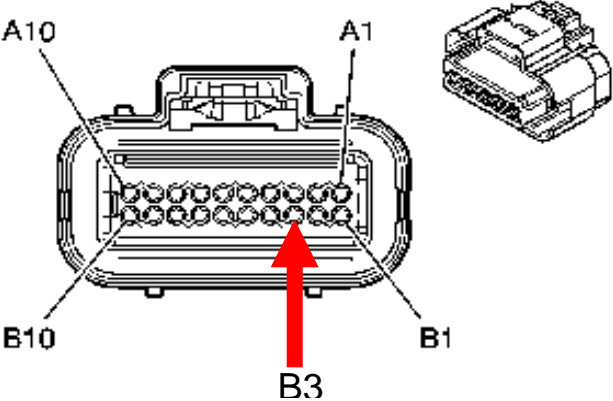
You will need to cut back some electrical tape and wiring loom to access the VSS wire. Once you have located the wire (**Yellow w/ black tracer**), attach the supplied gray (or red) Posi-Tap and route the wire back up to the engine compartment through the firewall to the VSS INPUT of the brake controller module. This wiring can be routed along with the air lines. Please note that there are a number of yellow wires in this harness.

### LB7

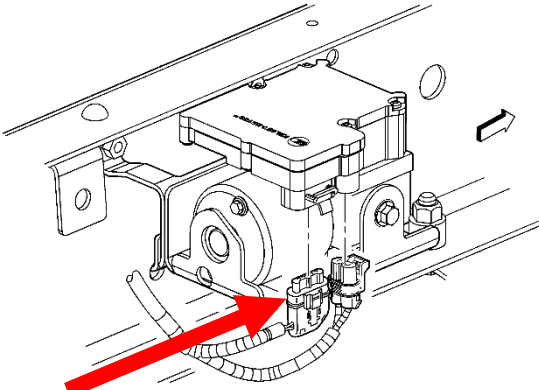
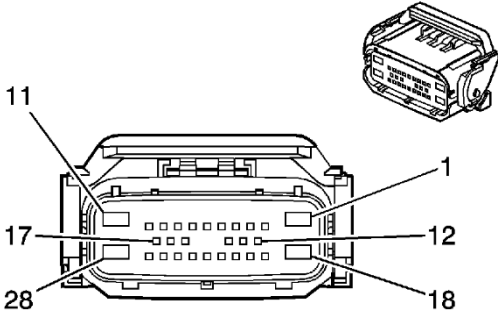
Vehicle Speed Sensor Signal (VSS)	Location	Wire Color
	Connector #2, Pin B1 or B3 depending on GVW or build date	YEL/BLK
		



**LLY/LBZ**

Vehicle Speed Sensor Signal (VSS)	Location	Wire Color
	Connector #2, Pin B3	YEL/BLK
		

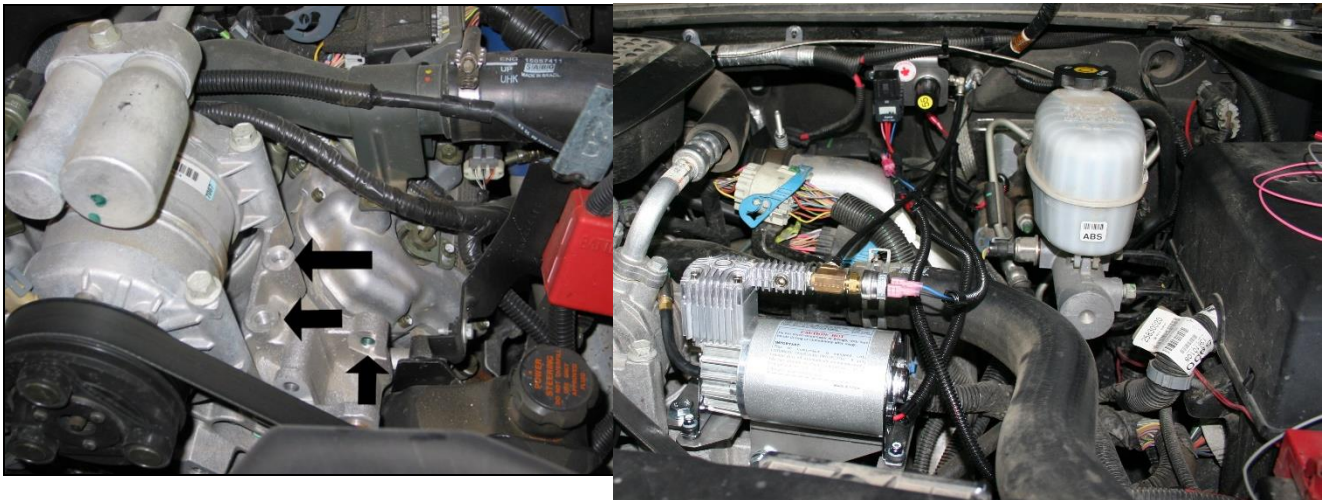
**LMM**

Vehicle Speed Sensor Signal (VSS)	Location	Wire Color
	Pin 19 (Reference Only)	Light Blue
	Pin 20 (Connect to VSS)	Yellow/ Black
	 <p data-bbox="778 1355 1453 1395"><i>View is internal mating side of connector</i></p>	

## Air Regulator & Air Compressor Install



Locate a spot just to the left of the brake master cylinder assembly and install regulator & relay assembly. You may have to remove the relay and the relay socket holder to enable access to the mounting screw.



Locate a position by the air conditioner compressor to mount the pump assembly. There should be two open ended threaded bolt holes that will accommodate the two rear mounts of the air compressor nicely.

Install compressor and mount assembly into the position as displayed in the photos above.

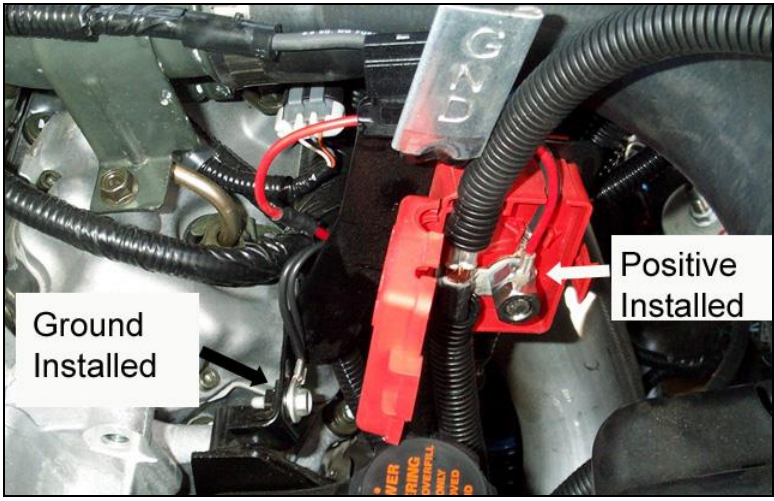

Route the air supply tube assembly installed onto the brake valve in earlier steps towards the regulator/relay/solenoid assembly. If necessary, trim the tube assembly to length. Attach the 1/8" tube to the air solenoid output on the bottom of the regulator assy. Secure the 1/4" tube with the air filter on the end nearby.

Cut and route a section of the supplied 1/4" plastic air tube from the pump outlet to the 90° fitting on the air regulator.

### ***Air Pump Electrical Hook-up***

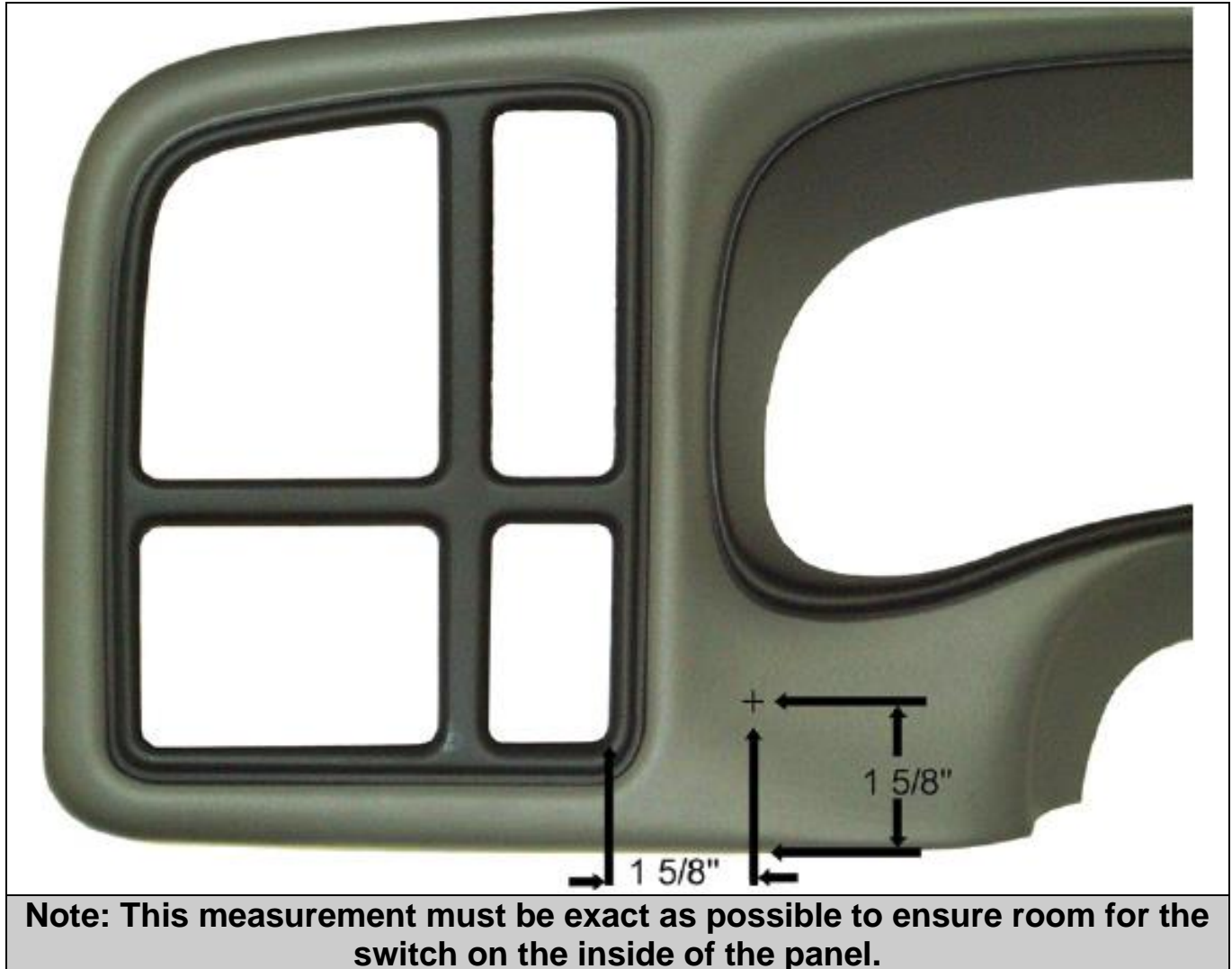
Route the pink brake activation wire from the brake control module through the firewall and over to the regulator & relay assembly. Crimp this pink wire to the pink wire from the regulator & relay assembly, using the crimp connector with the clear plastic heat shrink. Once this connection is made, shrink the heat shrink to seal the connection.

Locate the bolt on the power steering reservoir bracket below the newly installed air compressor. Attach the black ground wire with the ring terminal to this point. Finally, attach the positive battery connection.

<b><i>LB7/LLY/LBZ models</i></b>	<b><i>LMM models</i></b>
Route the red wire with ring terminal to the red battery junction box and attach the wire to the stud inside.	This wire will have to be routed to the driver's side battery terminal.
	

## Main Switch Installation

Measure and mark a spot for the toggle switch  $1\frac{5}{8}$ " up from the bottom edge of the dash panel and  $1\frac{5}{8}$ " in from the edge of the accessory panel as shown in the photo below. Drill a pilot hole with a  $\frac{1}{8}$ " bit. Finish drilling the hole with a Unibit to exactly  $\frac{1}{2}$ ".



Install the toggle switch into the drilled hole and secure it with the black plastic lock ring. Attach the black ground wire to a good ground located on the firewall. Re-install the kick panel and dash bezel to finish the installation. Follow the wire diagram on to finish connecting the Brake controller to the toggle switch.

Run the power wire from the exhaust brake toggle switch over to the fuse block and connect it to the installed fuse tap.

## ***Optional Shifter Switch (Push-Pull Style)***

Mount the shifter switch onto the shift lever using the clamp supplied. Run the electrical cable down the shifter shaft, securing the cable with zip-ties or electrical tape, and run it under the carpet to the firewall and under the dash to the Brake Control Module, leaving enough slack for proper shifting of the transmission lever and to prevent any rubbing of wire.

At the end of the cable, cut off any excess and strip away about 1 to 2 inches of the black rubber covering exposing the black and white (or green) wires then strip the insulation from the ends of the two wires.



Connect the white (or green) wire to the “12V switched” terminal on the Brake Control Module.

Connect the black wire to the fuse tap in the fuse box using a female blade connector.

Also provided in the kit is a Posi-Tap connector as an alternative to the fuse tap and flag connector. If you want to use the Posi-Tap instead of using the fuse tap in the fuse panel, then you will need to locate a 12V switched ignition wire to power the switch. You could also use the 12V Switched Power source that powers the Brake Control Module.

## Optional Shifter Switch (Rocker Switch Style)

Mount the shifter switch onto the shift lever using the clamp supplied. Run the electrical cable down the shifter shaft, securing the cable with zip-ties or electrical

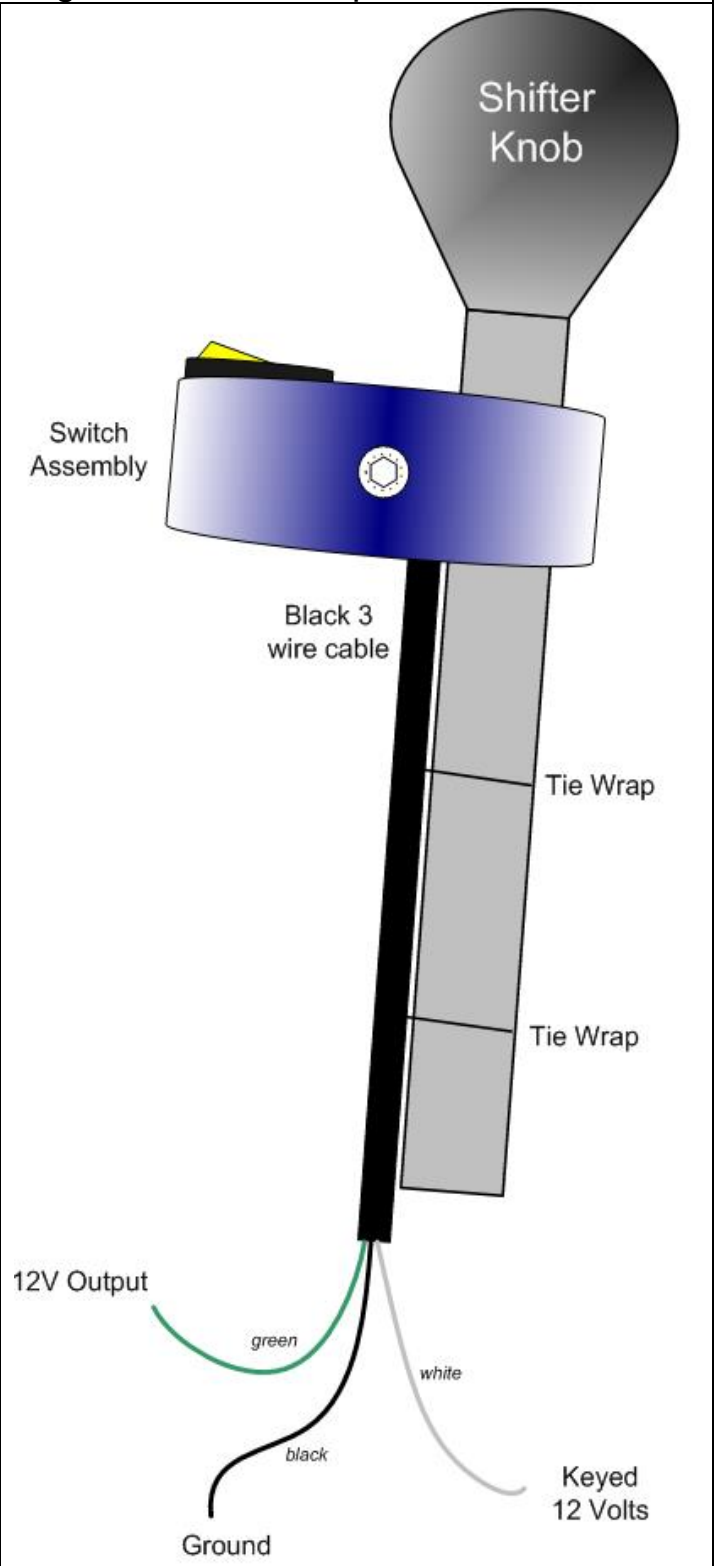
tape, and run it under the carpet to the firewall and under the dash to the brake module, leaving enough slack for proper shifting of the transmission lever and to prevent any rubbing of wire.

At the end of the cable, cut off any excess and strip away about 1-2" of the black rubber insulation exposing the black, white and green wires, then strip the insulation from the ends of the three wires.

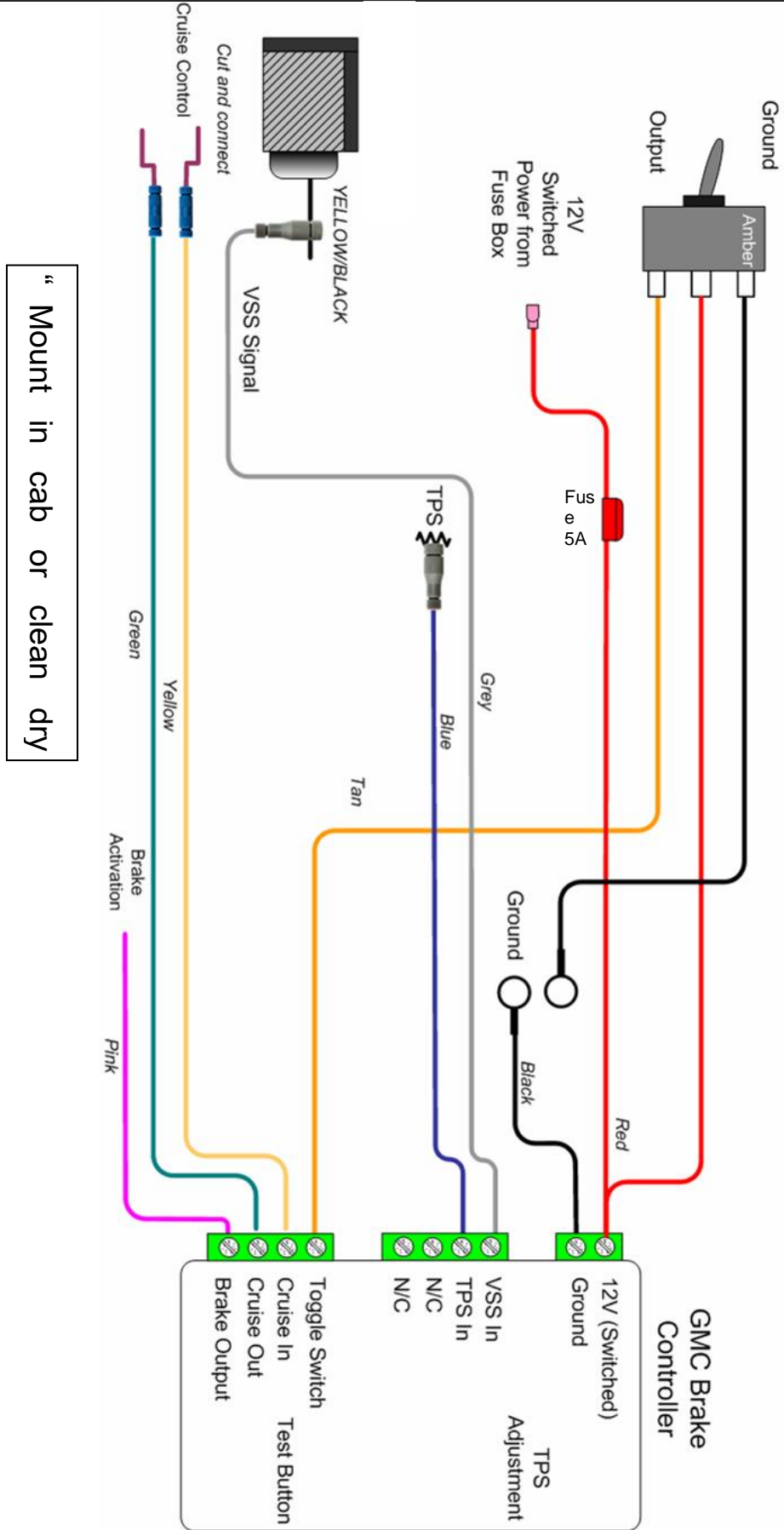
Connect the green 12V output green wire to the "12V switched" input terminal on the Brake Control Module.

Attach the 5/16" ring connector to the black ground wire and attach it to a good ground nearby.

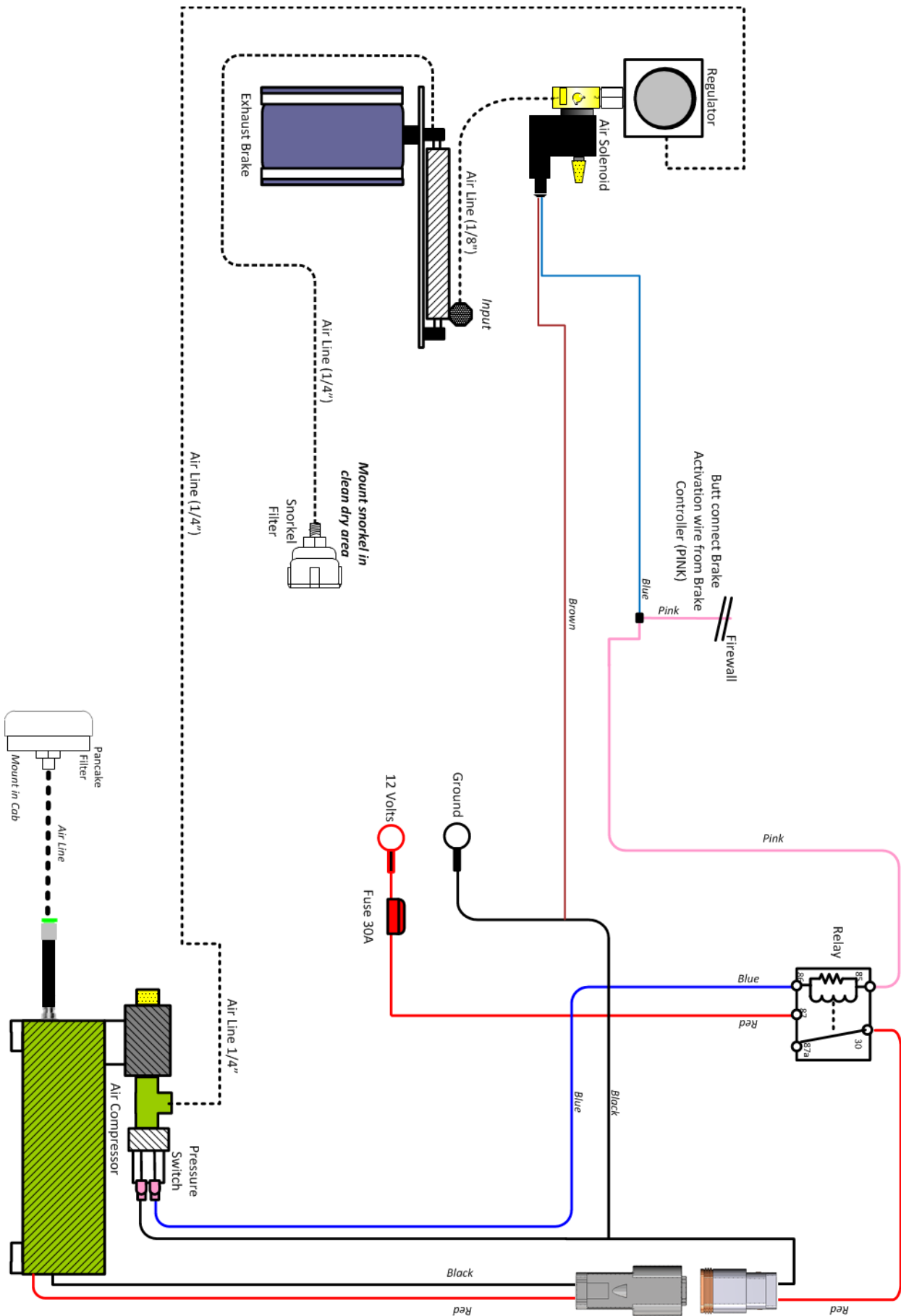
Use the supplied fuse tap to supply ignition switched power to the "Keyed 12 Volts" (white) wire of the rocker switch assembly.



# Wiring Diagram



# Wiring & Plumbing Diagram





## Brake Controller Calibration

Ensure the connections of the corresponding wires to the brake control module are correct as shown in the wiring diagram.

To achieve the correct setting for the activation of the exhaust brake in relation to the throttle pedal, the brake control module must be calibrated for your vehicle.

The brake controller has an LED inside of the case that should be visible through the semi-transparent case, which indicates brake activation.

Start the engine and while the truck is at idle, turn on the brake's toggle switch. Using a small flat bladed screwdriver, turn the small adjusting potentiometer on the bottom-right side of the brake controller module counterclockwise or clockwise until the brake engages and the LED JUST turns on.

You will need to hold the small test button on the side of the Brake controller during this process. This button must be pressed to calibrate the engagement / disengagement point of the exhaust brake, as normally the exhaust brake disengages below 15mph.

**CAUTION:** THE ADJUSTING SCREW IS A MICRO-SWITCH WHICH IS VERY DELICATE, SO TURN USING SMALL ADJUSTMENTS.

Test the new setting by revving the engine up to approximately 1000 RPM and releasing the throttle. As the accelerator pedal is applied, the test light should turn off just before the engine starts to rev, indicating proper calibration of the Brake

Control Module with the **TPS (Throttle Position Sensor)**. Remember to keep the test button depressed while you are in this procedure.

The exhaust brake and LED should activate again when the throttle pedal returns to idle. If not, re-adjust the brake controller module so that it does. Once you completed this procedure, re-install the lower dash cover.



TPS Adjust Potentiometer

## **2007.5-2010 LMM Model Specific Programming**

This software can be purchased from:

[www.hp-tuners.com](http://www.hp-tuners.com)

[www.efilive.com](http://www.efilive.com)

With the software you will need to reprogram the ECM,

# **Exhaust Brake Changes HP Tuners/EFI LIVE**

➤ Eng Diagnostics

○ AirFlow

▪ MAF Sensor

MAF Fail Low = 1g/sec

High Fail Delay = 655 sec

Low Fail Delay = 655 sec

➤ Engine

○ General

▪ EGR

Min ECT = 280°F

Max ECT = -40°

➤ Engine Diagnostics

○ DTCs

P0101 = 0 – Disabled

P0401 = 0 – Disabled

P0402 = 0 – Disabled

Without these codes eliminated, drivability will suffer.

## ***Exhaust Brake Testing***

Start the vehicle and check for idle pressure.

The idle pressure of the exhaust brake should be 15–20 lbs. This is the preset from the factory so it should not need to be adjusted.

***NOTE: The butterfly valve has been preset at the factory and should not need to be adjusted.***

Start the vehicle and take it for a test drive. ***You must have the truck in tow/haul mode for the brake to work correctly.*** The brake will only engage above 15mph and will not operate below this speed. Take the vehicle above this set speed, turn on the brake activation switch and let off of the throttle. The brake should apply and you should feel the vehicle slow down. Once 15 mph is reached, the brake will disengage automatically. Accelerate past the threshold speed once more, and let off of the throttle once again. Re-apply the throttle and make sure that the brake **quickly** disengages.

The brake must quickly disengage, if it does not, a PCM error code maybe generated. Some common reasons for a slow reacting brake would be: the brake controller being out of adjustment or air line restrictions.

Next you will need to test the brake for maximum retarding pressure. You can either do this under load from a large hill or perhaps from letting off the throttle at a high RPM.

The regulated pressure is adjusted with the regulator on the control assembly and has been preset to allow a MAXIMUM of 55psi of exhaust back pressure. Note that you should try to attain this maximum pressure.

***CAUTION: Do NOT exceed 55psi of backpressure.***

If you cannot reach the maximum desired pressure, start by checking for leaks at all exhaust flanges and welded areas, as this is the most common area for leaks. If no leaks are found, you may turn the pressure regulator clockwise for more pressure. If your pressure is too high, turn the pressure regulator counter clockwise to reduce the back pressure.

While driving, turn the cruise control on, and then try to activate the brake. The activation of the brake should disable the cruise control. Turn the brake off and activate cruise again, this time pressing down on the hydraulic brake pedal to ensure cruise control disconnects when the brake pedal is applied.

You may also notice that every time the vehicle is started the exhaust brake is cycled for a 1/10<sup>th</sup> of second. This should help everything stay free and clean and also reduce the possibility of the valve being contaminated.

**NOTE:** Over the next two weeks, the backpressure at idle may rise due to initial carbon build up and the brake valve will need to be adjusted again.

Check for any exhaust leaks and recheck all connections and hoses for security and interference from moving or heated items. After about 100 miles (160 km), re-torque the clamp bolts.

## ***Valve Maintenance & Troubleshooting***

To extend the life of the valve assembly, do not operate vehicle for extended periods of time without activating the exhaust brake. We suggest activating the brake at least a couple times on any day you operate the vehicle to prevent any carbon or rust build-up on the inner components of the valve assembly.

The hoses, wires, fittings and clamps should be inspected on a regular basis for any deterioration, damage or leaks.

Following the diagrams in this manual, tracing hoses and wiring, checking continuity through electric components or checking for any lines that are disconnected, should solve any problems that may arise. If you have any problems or need replacement parts, call us at 1-800-887-5030, between 8:30am and 4:30pm Pacific Time.

***FOR MAXIMUM EFFICIENCY USE TRANSMISSION IN TOW/HAUL MODE***

# Troubleshooting

## Version 2

For one whenever the brake controller is powered there will be a flashing light. This shows that the unit has power and the microprocessor is functioning normally. The second LED comes on when the Brake Output is energized. For example when you press the test button.

## Version 2.01 and Newer

This unit does away with the blinking light. There will be a Red LED that operates when the Brake Output is energized This shows that the brake is being requested to activate. The second LED will only come on once the VSS signal is met. So below 15 mph the LED will be off above 25 mph the LED will be on.



As well you will notice an “EBP ADJ” potentiometer on the side of the brake controller. The potentiometer is only used if you run into EGR problems. Please contact BD before adjusting this.

## ***Operating Guidelines***

Thank you for taking interest in the BD Engine Exhaust Brake. As a driver, you probably already know the need for extra braking power that your vehicle requires on the hills and long grades. With loads being towed behind you, the extra push when slowing down or maintaining speed on downward grades can prove to be a great strain on your vehicles hydraulic braking system, even to the point of “burn-up”. These guidelines were designed to offer you a better understanding of the benefits of exhaust brakes and are partly based upon material developed by the U.S. Department of Transportation National Highway Traffic Safety Administration.

The emphasis on today’s vehicles is to give the consumer a product that can give them usable power with fuel efficiency. But, in the transition, the vehicles have lost their natural braking power, making it more easy for the vehicle to continue to roll and harder to stop. Of course, this gets more noticeable with the increase of weight, on or behind the vehicle. This is where an exhaust brake becomes a useful tool in increasing the driveline drag of the vehicle without the use of the hydraulic brakes. It is a tool that with maximum use, or even occasional use, can reduce wear on hydraulic braking parts and at the same time increase safety.

The BD Exhaust Brake can be used to help maintain a controlled vehicle speed on a downward grade, as well as slowing the vehicle down for such times as turns or exit ramps, without you using your hydraulic brakes. **NOTE: The exhaust brake cannot be used as a parking brake. It will not bring your vehicle to a complete stop.** By using a BD Exhaust Brake, the life and effectiveness of your hydraulic brakes will increase.

This is because of the decreased use of the hydraulic brakes in situations like hills, the wear factor is reduced and there is less opportunity for your hydraulic brakes to heat up which would reduce the efficiency. When you ride your hydraulic brakes, make hard stops or have poorly adjusted brakes, this creates high temperatures and as your brakes get hotter, the more chance there is for fade or failure.

With terrain that is a series of up and down grades, the BD Exhaust Brake will aid in reducing exhaust valve warpage. Because of the power needed to pull your vehicle and load up a hill, this generates a lot of heat. When you have reached the crest of the hill and are now coasting down the other side, the heated valves are too quickly cooled. With the exhaust brake engaged, the heat loss to the valves will be reduced, which can prevent valve warpage.

When the toggle switch is turned to the “On” position, the valve is activated every time the driver takes his foot off of the throttle pedal. When the driver puts pressure back on the throttle pedal, the throttle switch (or electronic brake module) is deactivated and the valve opens again. Exhaust brakes are designed to operate with the throttle at idle, not to be used in conjunction with cruise controls, and not

designed to aid in gear shifting. Such cases could cause damage to engine and/or the exhaust brake.

The best scenario for exhaust braking is when going down hill, select a gear that lets you maintain a constant speed with little or no use of the hydraulic brakes, or the same gear that would be used to go up the same grade of hill. This also depends on the weight, load or road conditions that the vehicle will come upon.

So, in summary, by using the BD Exhaust Brake, you reduce the need for use of your hydraulic brakes in situations where you need to slow down or maintain (i.e. hills, off ramps, corners, approaching speed changes or traffic lights). Reducing the use of your hydraulic brakes in these situations will reduce the heat build up, as well as wear and damage to linings and drums.

And, when you reduce these factors, you save your hydraulic brakes for when you really need them (for stopping or emergencies).

The BD Exhaust Brake is not a substitute for your hydraulic brakes and, cannot correct or compensate for poorly maintained or misadjusted brakes. But, when you need to slow down or maintain a constant speed, the BD Exhaust Brake will be a valuable and effective tool. Exhaust Brakes are more efficient at preventing than correcting an over speed condition.

## ***Exhaust Back Pressure Testing Air Actuated Brakes***

***It is recommend that you purchase the BD pressure gauge kit #1030050***



***NOTE: The brake stop-bolt and regulator have been preset at the factory and should not need to be adjusted.***

***You do not need to measure the air pressure in the system, just the exhaust backpressure. There is a test port provided on the brake valve itself.***



### **Idle Pressure Test**

With the BD brake engaged and the engine at idle check the exhaust backpressure using a pressure gauge (such as BD PN 1030050) at the test port on the brake valve.

If the back pressure is below 13 psi at idle you have a number of likely causes. The most common being an exhaust leak either at the clamp joint or at the welds (only on some models). Apply the exhaust brake and have someone assist you looking for soot trails or the visible leak. Another culprit would be an exhaust manifold leak, turbocharger gasket leak, turbocharger problem or an EGR issue.



If the back pressure is greater than 25psi, you will need to make an adjustment on the stop bolt. Loosen the jam nut, and lengthen the stop bolt towards the actuator, this will shorten the stroke distance. Only turn 1/4 rotation at a time and re-secure the jam nut. Retest idle pressure.

We generally do not recommend adjusting the stop bolt, please consult BD before doing this as it may void your warranty.

### **Off-Idle Pressure Test & Adjustment**

Your BD exhaust brake is a variable-orifice design so when the brake is active and the engine is at higher RPM the brake lever does not rest on the stop bolt. Off-idle backpressure is set by adjusting the air pressure regulator which will in turn increase or decrease off-idle exhaust backpressure. You will need to secure your pressure gauge somewhere that you can see it while you are driving. Using a long extension hose & bringing the gauge into the cab through an open window or clipping it under a windshield wiper works well.

Get the truck up to speed (a downhill grade or a load in the truck is helpful) and activate the exhaust brake. Note the maximum backpressure achieved. You should get peak backpressure at higher RPM (try 3000 RPM in Drive). If you cannot reach the desired backpressure (compare table below) you can begin troubleshooting, the first step is to look for exhaust leaks either from the clamps, exhaust manifolds or feed pipes. Also look for leaks at the clamps located at the back of the turbo and also at the down pipe. If all connections are sealed, you can then use the adjusting regulator to increase the backpressure. Note that small regulator adjustments can have a significant effect on off-idle backpressure.

Turning the regulator **clockwise** will increase pressure.

Turning the regulator **counter clockwise** will decrease pressure.



**NOTE:** Over the next two weeks, the backpressure at idle may rise due to initial carbon build up on the inside of the brake housing and on the butterfly. The stop bolt may need to be adjusted again to compensate.

Application	Maximum Back Pressure
GM/Chevy 6.5	35 psi
GM/Chevy Duramax	55 psi
Ford Powerstroke	45 psi
Dodge Cummins 1988-98 12V w/o 60lbs Springs	40 psi
Dodge Cummins 1988-98 12V with 60lbs Springs	60 psi
Dodge Cummins 2002 and Newer	60 psi

\*HD Spring part# is 1030060.

CAUTION: Do NOT exceed the maximum back pressure value in the exhaust system. Exceeding this pressure will force the exhaust valves open during the intake stroke which could cause engine damage.

Thank you and happy motoring.

BD Engine Brake, Inc.