



Automatic Exhaust Brake Switch

by Flopster843

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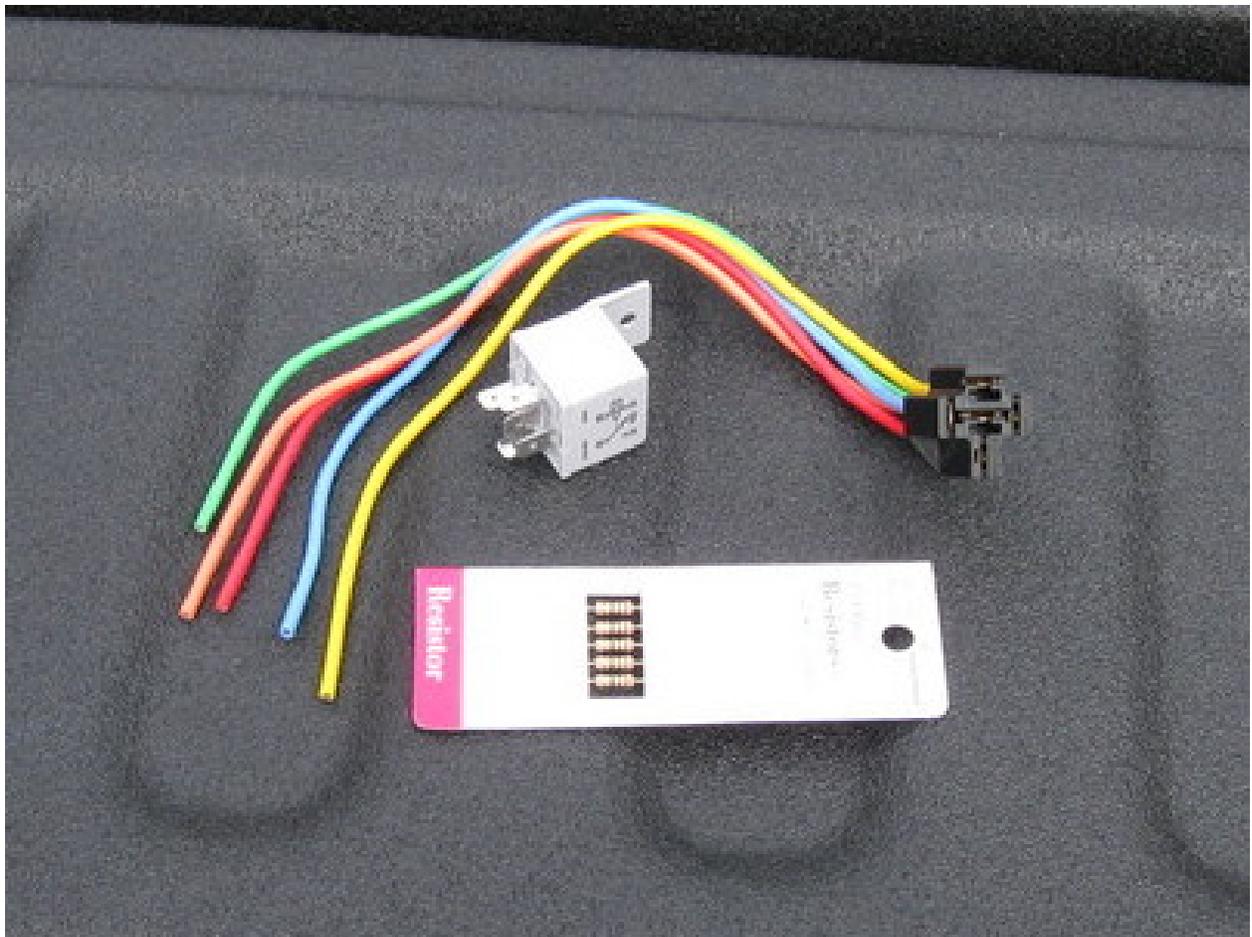
Let me start by saying that I did NOT come up with this modification myself. I followed a very informative thread on CumminsForum.com where some very intelligent people were discussing this modification. If you go over there and search for "Exhaust Brake Switch" in the 6.7L forums, you'll be able to find the thread and read it in its entirety.

The exhaust brake feature on the 6.7L Cummins is a very handy feature to have. It helps you slow down without utilizing the trucks brakes, helps keep the turbo from sticking due to soot buildup, and it sounds cool. The only problem with the exhaust brake is the fact that it will not stay activated by itself. Every time you shut down the truck, the brake will default to the OFF position. So next time you start the truck you have to press the switch again. It's a small nuisance that many people can live with, but it's pretty easy to create a system to automatically turn on the exhaust brake every time you start your truck.

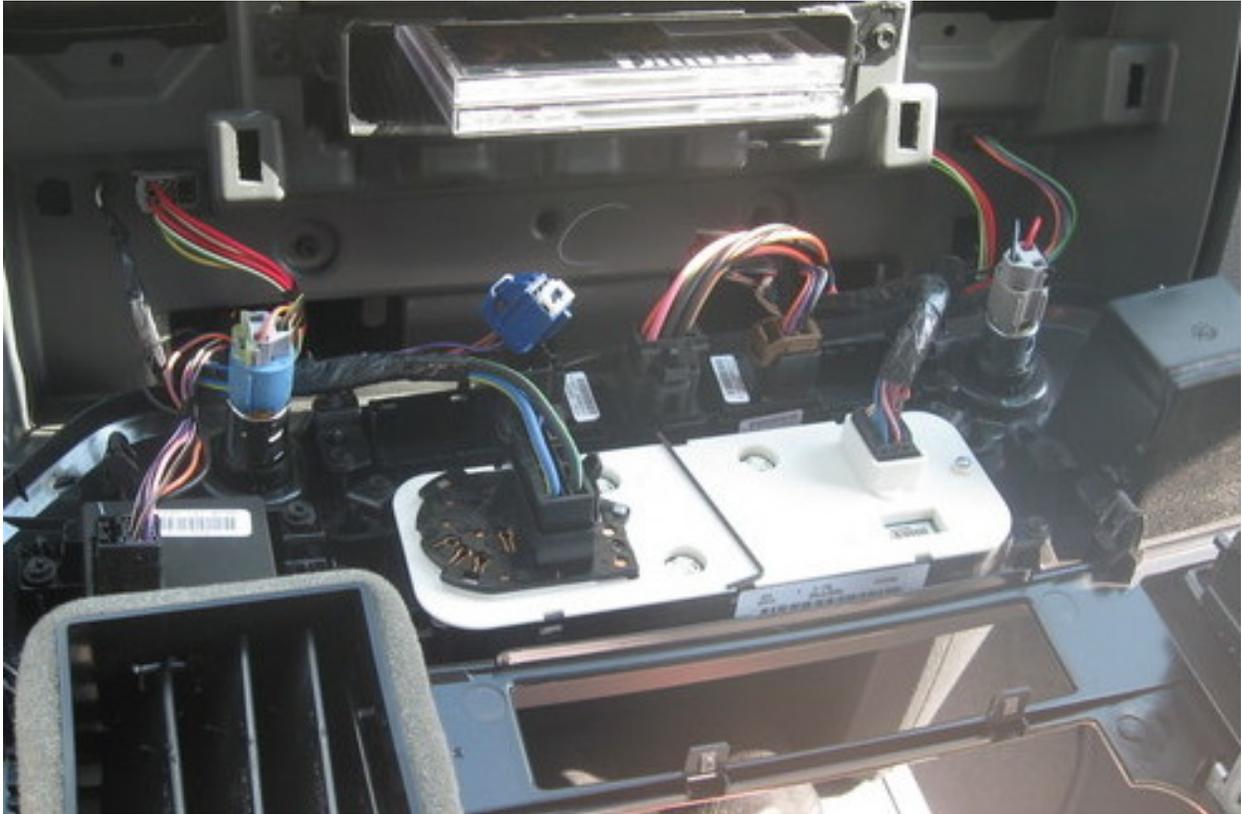
The exhaust brake utilizes a momentary switch to engage/disengage the system. The switch only makes contact while it is being held down. When you push down the switch it sends an electrical pulse of a specific voltage to the ECM telling it to engage/disengage the exhaust brake. When the switch is released, the circuit is broken and power flow to the ECM stops. This is why you can't wire in a manual switch and expect it to work. If power is constantly applied to the circuit, the brake will not engage.

We need to create this electrical pulse to make the switch work, and this pulse must be of the exact voltage the truck is looking for. Standard 12V power will not work. This pulse can be created utilizing an automotive relay and a switched power source to power the relay. To achieve the specified voltage required, a resistor must be used.

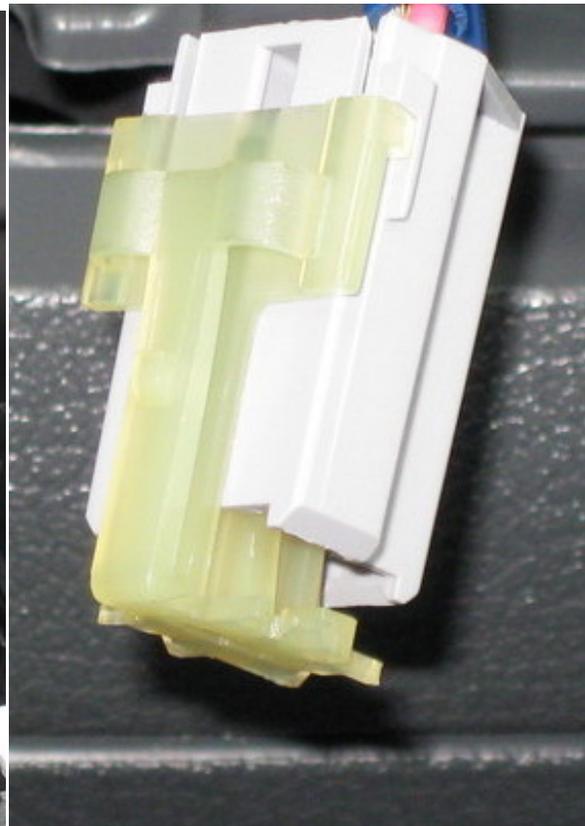
I purchased a Single Pole Double Throw (SPDT) relay from Advance Auto Parts, (P/N R3074Z, \$11) and a pack of ½ watt 15 ohm resistors (\$0.99) from Radio Shack. THE RELAY YOU PURCHASE MUST BE A SPDT RELAY. ANY OTHER RELAY WILL NOT WORK. You will also need to purchase some wire and connectors to attach the relay to the truck's wiring system. I'm not a big fan of wire taps or open connections, so I decided to purchase a relay socket from NAPA. (P/N EC23, \$11) I will solder the wires and utilize heat-shrink to make all connections in the truck. The relay will connect two wires behind the exhaust brake switch and will be powered from the cigar lighter circuit. The reason for this is simple; the cigar lighter is not powered during key on or engine start, but is powered after. The relay is wired so that when the cigar lighter has no power, the exhaust brake wires have contact. Once the truck is started, the cigar lighter has power, causing the relay to energize, thus leaving the wires on the back of the exhaust brake open, hence the electrical pulse required. It's the exact same thing as if you were holding the exhaust brake switch while you start the truck and then release it after the truck starts.



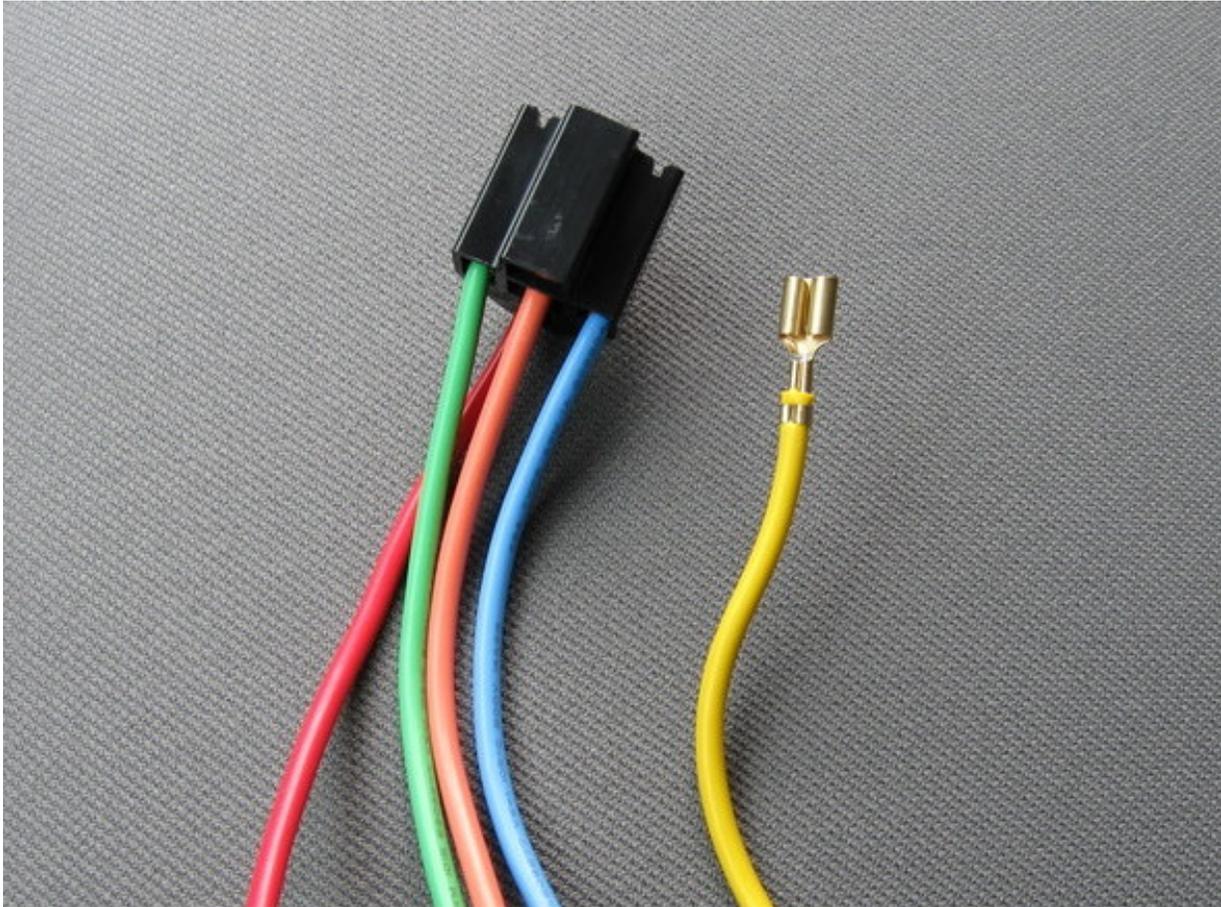
Start by removing the center panel on your dash to gain access to the wires on the back side. It's held in with snap connectors, so you just pull it off. I found it easier to start with the corner by the glove box and work my way around. This is probably the hardest part of this entire mod. Once you have the panel down, I suggest you remove all the connectors on the back side so you can set it out of the way to avoid damaging it.



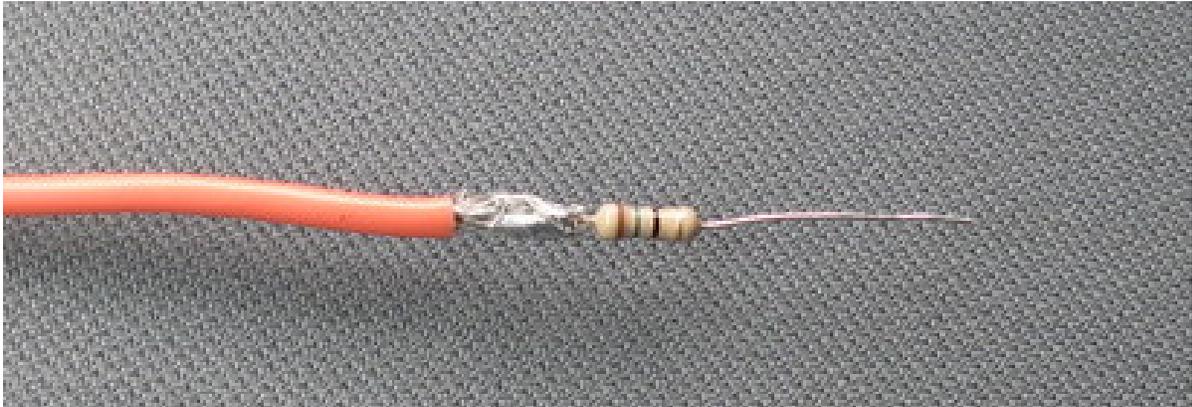
Once I had the connectors removed, it was time for me to take the pins out so I could solder the relay socket harness to them. If you decide to use wire taps then you don't have to do this part. The exhaust brake switch plug has a white insert in the center of it which can be pulled out approximately ½ inch. This allows you to release the hooks holding the pins into the plug. Insert some sort of tool (I used a small Allen wrench) into the connector beside the wire to release the hook, then pull the wire and tool back out together. You will need to release pins 3 (Violet/Brown) and 4 (Brown/Orange) from the connector. You will also need to remove pin 1 (Pink/Yellow) and Pin 3 (Black/Yellow) from the cigar lighter connector. This connector has plastic slide thing on the side that needs to be slid down to release the pin lock. Insert the tool just like the last connector to release the pins.



Now that the connector pins are loose, it's time to prep the other part of our harness. The relay socket comes with all 5 wires installed. We are only using 4 wires, so the 5th wire (the yellow one) is removed from the harness. This is the one that would connect to pin 87 on the relay. It comes out the same way as the two connectors on the truck except the tool is inserted into the face of the plug rather than the back side. After that wire is removed, the remaining 4 wires are stripped back approximately ½ inch.



Now that the harness is prepped, it's time to start hooking stuff up. Start by soldering the 15 ohm resistor to the pink wire (pin 87a) on the harness. I covered the top half of the resistor and the splice to the pink wire with heat shrink leaving the other end of the resistor exposed. This will help keep the splice isolated and force all current to go through the resistor. After that is complete, solder the completed wire/resistor combo to the brown wire with an orange tracer from pin 3 on the exhaust brake switch. Be sure to leave the resistor far enough back so you will be able to re-insert the wire into the plug. (I didn't do this at first and had to move my resistor back and re-solder.)



Now solder the rest of the harness to the correct pins. (There's a wiring diagram below to help you out with this.)

- **Attach the red wire from pin 30 on the relay to the violet wire with brown tracer on pin 4 of the exhaust brake switch.**
- **Attach the blue wire from pin 85 on the relay to the pink wire with yellow tracer on pin 1 of the cigar lighter.**
- **Attach the green wire from pin 86 on the relay to the black wire with yellow tracer on pin 3 of the cigar lighter.**

Once all the connections are made, cover the exposed wire with heat shrink to insulate everything.



Re-insert all the pins in to their correct locations. Please note that each connector has one pin that is not used, double check the wiring diagram to make sure everything goes back in the right place. Once the pins are in, slide the plastic tabs on the connectors to lock everything.



Insert the relay into the wiring harness and find a place to mount it. I found that it'll mount very nicely to the right-hand screw under the radio. I put a couple of washers under it to bring up the mounting surface so it'll be flush with the top of the plastic. It'll make more sense when you actually see it for yourself. It won't fit on the left hand side due to the massive electrical connector that comes out of the back of the HVAC controls. Re-attach all the other electrical plugs that you removed in the first place to all the correct components. All the plugs will only attach to one thing so it's impossible to get them mixed up. Then simply re-install the bezel around the radio assembly by snapping it back in place. That's all there is to it. From this point on, the switch will come on whenever you start the truck. Enjoy your new automatic exhaust brake switch.

