

NPP “Stealth/Factory/Wild” Conversion

There have been several posts looking for a method to have three NPP modes incorporated into a single switch.

Stealth – exhaust flappers closed all the time

Factory – flappers operate as per the factory parameters (more below)

Wild – flappers always open

There are other methods to achieve the same result, but this is the way I would do it:

First, a quick overview of how the system works

It is basically electrical control over vacuum actuation. The engine supplies vacuum to the system, the vacuum is stored in a tank to cover periods of low or no engine vacuum (WOT and start up). A check valve is upstream of the tank to keep the tank from dumping vacuum back to the intake manifold when there is no vacuum source. Electrical control comes from magic boxes sensing everything and deciding when to open and close Q15 (exhaust flow control valve).

The Camaro NPP factory system is programmed to be open at idle, close about 1,500-2,000 rpm during normal driving and be open at > ~75-80% throttle position. I don't have one to verify, but I believe the Corvette programming is different (closed at idle).



The above picture shows the vacuum lines, storage tank, control valve and actuator, if you look closely at the actuator you can see the safety wire I had in place to hold the valves closed while I was figuring

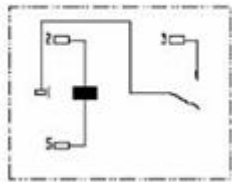
out an electrical solution. A funny thing about my vacuum tank, it has “top” marked on it that is on the bottom. I left it as it was. The tank is the black box on the right with a single vacuum connection, the control valve is protected by the Tetris shaped cover just to the left of the tank and the actuator is the round object attached to the output of the muffler. There are 2 actuators, one for each muffler. The control valve receives a 12v input to open vacuum to the actuator, when no 12v is present it dumps vacuum from the actuator but does not dump vacuum from the tank.

Ok, now for the mod:

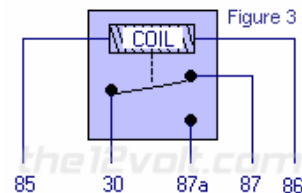
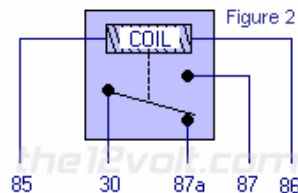
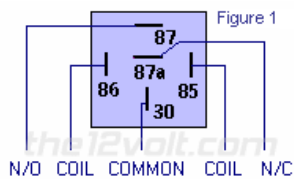
Supplies: wire capable of handling 10amps, a normally open relay (SPST-single pole single throw), a normally closed relay (SPDT-single pole double throw), 3 way switch (on-off-on), T-splices, male/female spade crimp ons, eye crimp ons, fuse holder and fuse, bolt/nuts, tie wraps & tape. Make sure that the relays and switch you select are rated for 10amp or above. 30 and 40amp relays are very common

SPST Relay – a normally open switch (this is the type of relay that Chevy uses to control the flappers) ID'd by the 4 terminals

SPST-NO



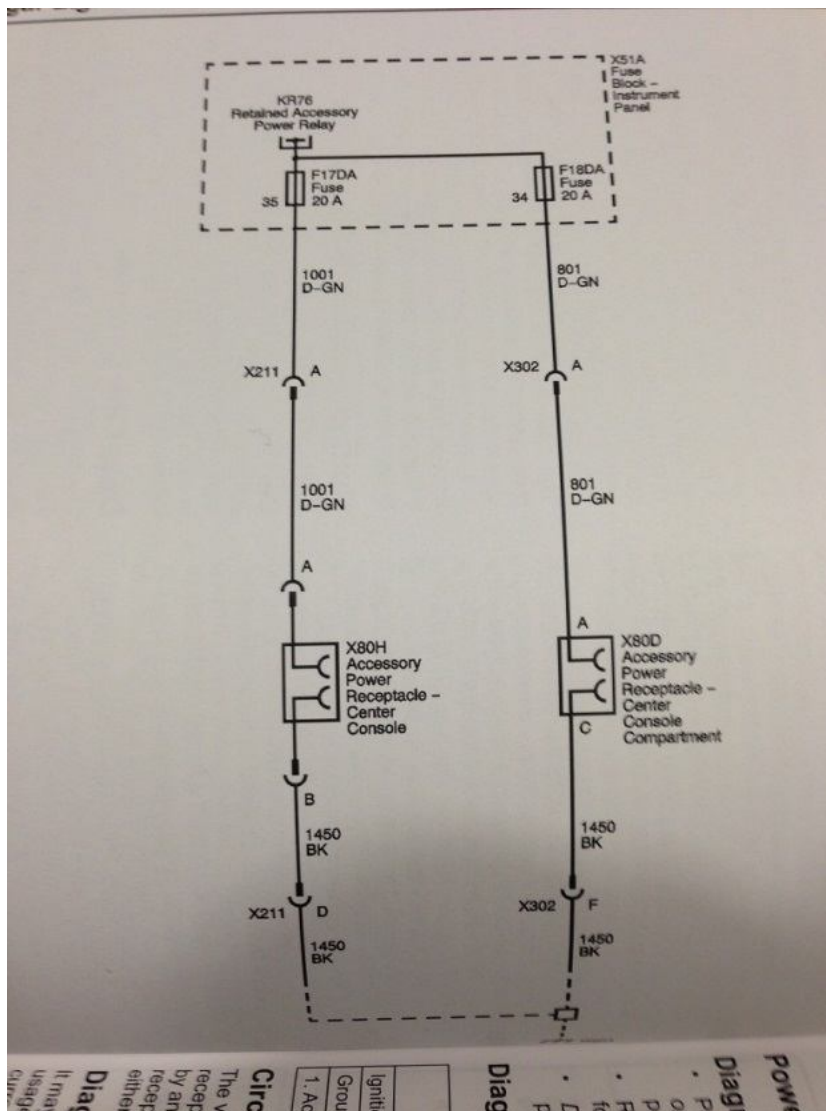
SPDT Relay – it has both a normally open and a normally closed switch (we will only use N/C) has 5 terminals



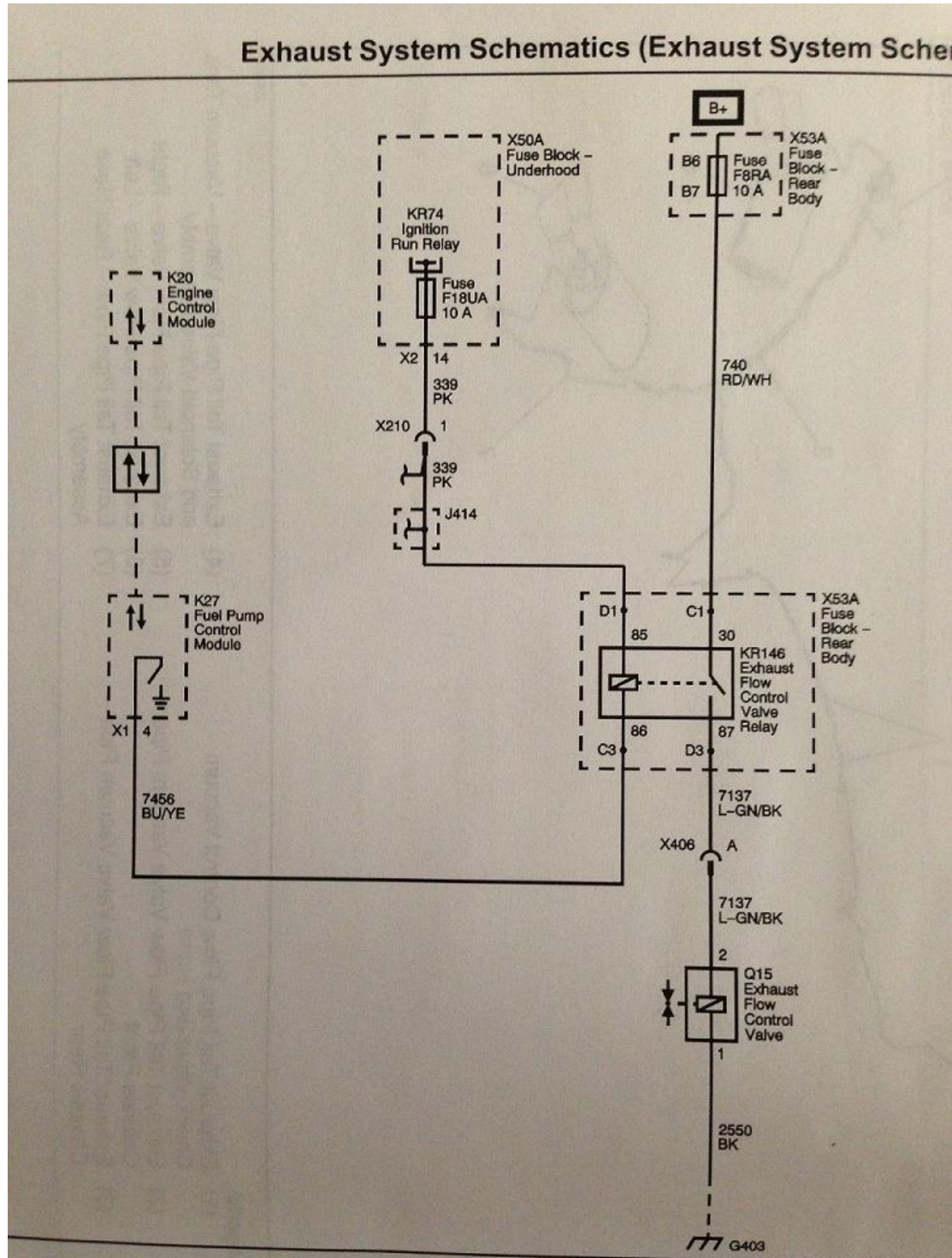
12 volt, 3 way, on-off-on switch, rocker or toggle



For the power to switch the relays, I wanted an ignition switched 12v source from the center console. I chose the cigarette lighter circuit since it was easy and would have more than enough power to close and hold the relays. Tap into the dark green wire upstream from the main connector for the console. You can T in there because it is an easy location, although it does mean that a connector will have to be added to allow removal of the console if needed later without removing the switch. Put an inline fuse holder and fuse right after the T-connector. The "hot" wire is connected to the center tap of the on-off-on switch. Then mount the switch anywhere of your choosing, on the side of the console by the driver's knee is a handy spot. If you don't switch modes a lot, inside of the storage area of the console. All that is left is to run 2 wires, 1 from each side of the switch back to the trunk.....you can remove the rear seat bottom and back and then route the activation wires along the existing bundle back through the passenger side and into the trunk.



Below is the factory wiring for the relay and the control valve



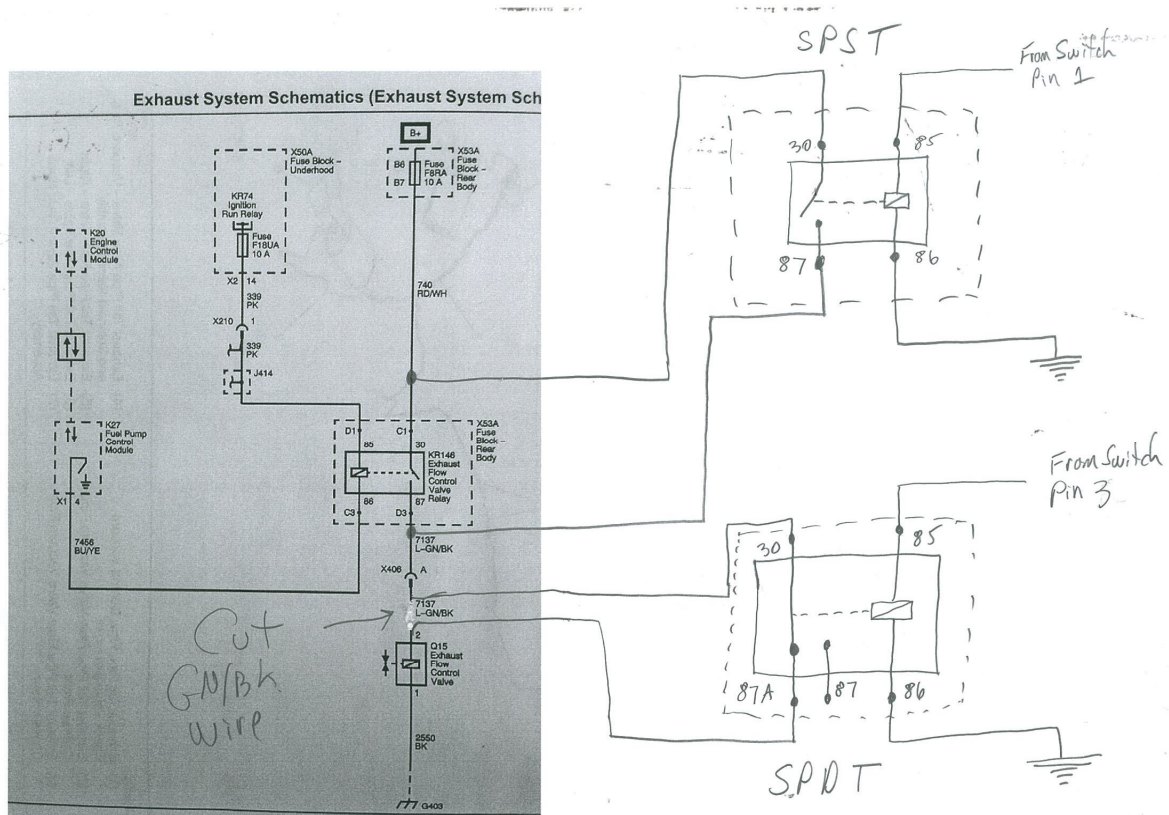
Note that the 12v source for the existing factory relay is hot all the time and rated for 10amps (red/white wire). This is why the relays and wires need to be rated to 10amp or above. I went ahead and rated the switch the same since it is protected by a 10amp fuse. The fuse should ALWAYS be the lowest rated component in a circuit.

For the Stealth portion of the wiring put the SPST relay parallel to KR146

Splice into the red/white wire at the input to X53A (fuse block in the trunk on the passenger side) and connected to pin 30 of the new SPST relay. Then run a wire from pin 87 of the new SPST relay and splice into the green/black wire on the upstream side of the X406 connector. Then make a ground wire to go from pin 86 and connect it to the existing ground point near X53A fuse block. Take one of the activation wires from the switch in the console and connect it to pin 85. You can mount the new relay to an existing hole just above the ground point. Picture below



Below is the modified drawing showing both relays in the circuit. (keep in mind I am not an electrician or artist)



Take the second activation wire from the console and connect to pin 85 of the STDP relay, then make up a second ground wire and connect to pin 86 and the ground point. Cut the green/black wire between the exhaust control valve, Q15 and the previously installed T for the stealth mode. Connect pin 30 to the fuse box side and pin 87A to the control valve side. NOTE: pin 87 is not used

Putting the switch in the middle position will keep the system in factory mode, switched one way it will be wild and the other way it will be stealth.

For my car, I did the stealth mode only (now that I've gone through this exercise, I think I'll put in the second relay)

Good luck
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