

2010 Subaru Outback and Legacy Navigation Hacks

- Control lockout override via grounding of unused e-brake input
- Rear camera input switch

DISCLAIMER: Anyone following these instructions is doing so at their own risk and agrees to not hold me liable for any damage caused as a result of reproducing my experiences that I am documenting here for your reference only.

Parts needed:

For lockout override:

- CD-ROM internal analog audio cable

For rear camera:

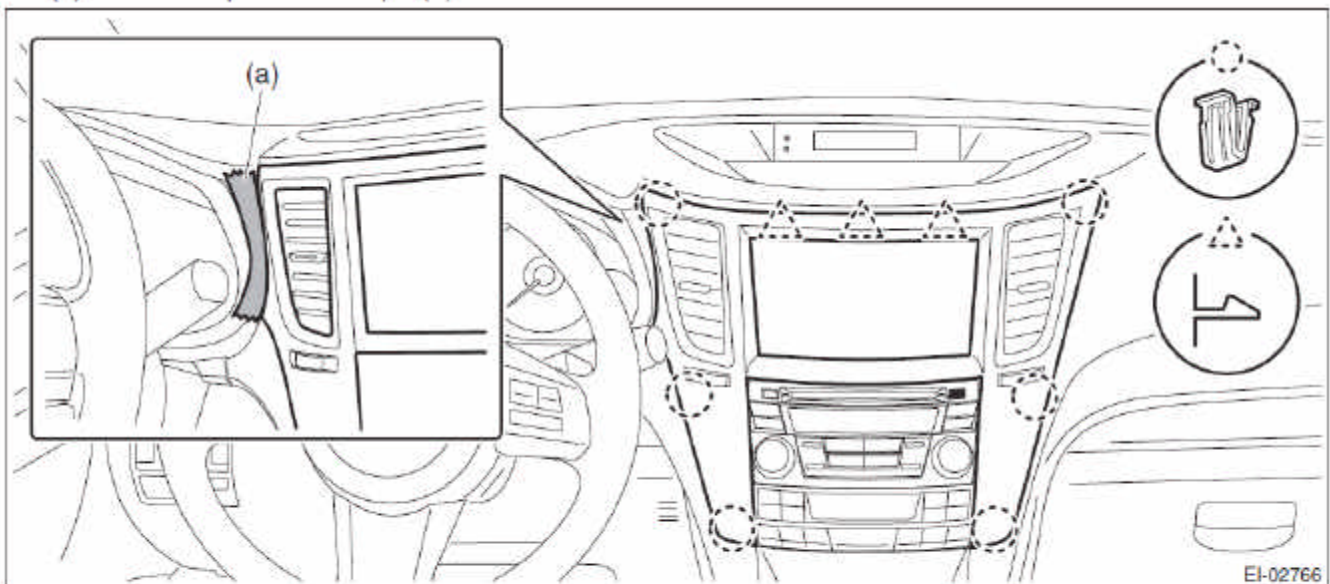
- 16 or 18 gauge copper stranded automotive grade wire
- (2) Vampire taps for 16 or 18 gauge wire
- Push-button automotive switch (Pep Boys: Pilot Automotive **P/N PL-SW28B** \$5.99 – Note: I found this in the mods section of the store, not the electrical parts)
<http://www.pilotautomotive.com/distributors.aspx>
- (3) butt connectors or wire nuts suitable for joining 2 16/18 gauge wires
- Electrical tape suggested to strap wires to prevent vibration

Tools needed:

- Philips screwdrivers, #1 and #2 (one regular length and one long-shaft #2 Philips is helpful)
- Trim pull tool, or small plastic chisel/scrapper, or rubber coated flathead screwdriver
- Voltage/continuity meter is helpful
- Painters tape and towels to protect car

PART 1: REMOVAL OF BEZEL

Subaru's instructions indicate that the bezel can be removed by hand. No one on any message board seems to be able to do this. The solution many have found is to use a trim removal tool. I bought a cheap one at Wal-Mart and quickly found that any small plastic chisel or rubber-coated screwdriver will do. The trick is to get just enough leverage using the tool from inside the vents to pop off the corners. Using your fingers just isn't quite enough.



- (2) Insert a finger into the air vent grille and release the left and right clips at the top of the center panel.
(A), (B)
- (3) Insert a finger into the air vent grille and release the left and right clips at the center of the center panel.
(C), (D)

As you can see, I did use a cheap trim removal tool, but found using the stubbier end worked better for me.

Insert any kind of soft (plastic or rubber) tool with a thin edge into the vent and feel for the lip underneath.

The hardest part is to get the willpower to give it a good, firm yank towards you. Every time I pulled off another section, I swore it was going to break in half.

...But I took my time and it didn't.

Reference the drawing above to see the locations of the actual latches (dotted circles). Once you get the first corner out, the rest gets a lot easier.



Use your hands and fingertips to yank out across the top and into the other corner.

Then use both hands to pull out both sides while working your way down toward the climate control.

I found using the trim tool helpful as shown here for gently prying as I got closer to the bottom.

Note the painters tape in the photo, as recommended by Subaru, along the side of the gauge cluster to prevent scratches.



When you pry up into the vent, you might pop out the vent assembly from the bezel, like I did.

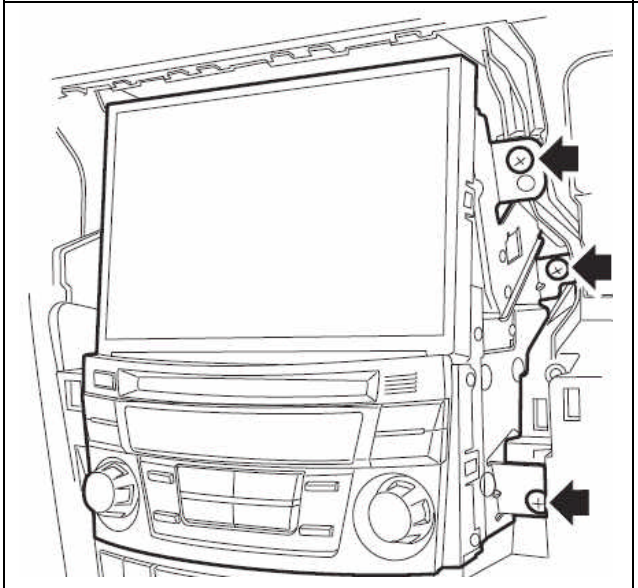
Don't panic. Reassemble by inserting the fingers at the top to the *inside* of the slots (both circled) in the vent assembly. Then everything just snaps back in.



Here's what the bezel looks like from the inside. The yellow areas are the snap-in fasteners that you worked so hard to remove in the steps above.



Next step below: Remove the 6 screws that hold in the assembly. The middle ones are recessed pretty far back. I suggest a long-neck Philips screwdriver and/or magnetic bits to remove them.



Before pulling out the nav unit, pile up towels in the center console up to the level of the climate control, so the nav has somewhere to rest.

You may also wish to first apply painters tape onto the front of the climate control and work it into the crevice above.

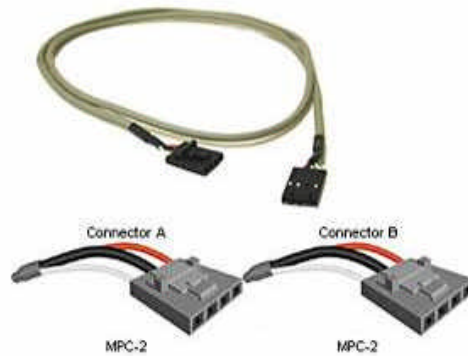
Pull the nav straight out, be careful not to scrape it against any trim. **There is very little travel with the harnesses in the back;** you will only be able to pull it out about 2 inches beyond the front of the dash.

While pulling it out, try to put a towel under over the top of the climate control if you didn't already put painters tape there. (I scraped a small chip in mine by not doing this at first.)

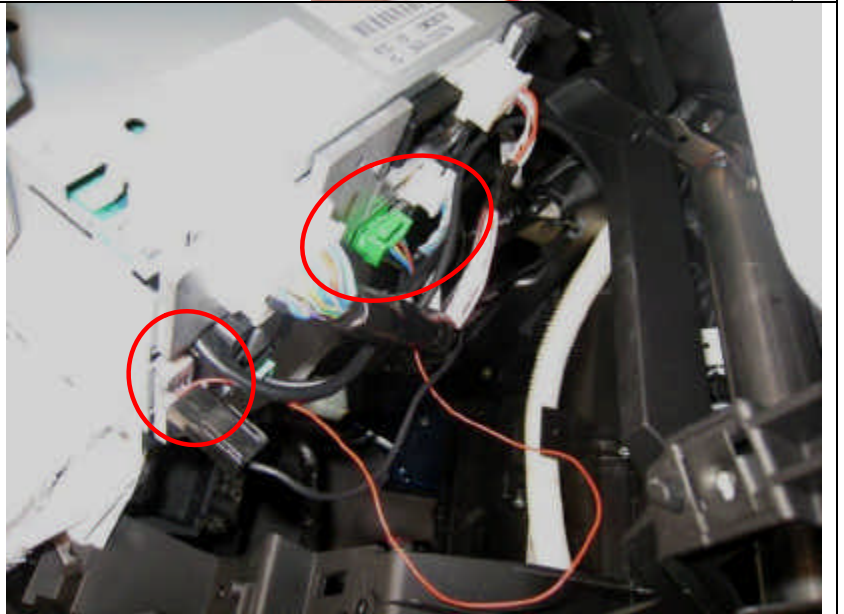


PART 2: HACKING THE NAV CONTROL LOCKOUT BY GROUNDING THE UNUSED E-BRAKE INPUT

With a CD-ROM internal analog audio connector, use a small screwdriver to pry the plastic clip in the connector up so you can slide out one connector pin and wire. Strip down the casing 6-10" and cut. Discard the rest of the CD-ROM cable. All you need is what is shown in the picture on the far right.



In the green connector shown, push the end of the CD-ROM wire with the connector pin into the unused hole (pin #2 on connector i145) **between the Green and the Brown/Yellow wire**. Keep pushing it in until you feel it firmly engage with the pin from the nav. It may take a few tries to align it right. You'll know when you get it, you'll feel a firm engagement, and it won't slide out easily if you give it a little tug.



On the other side (the passenger side of the car) there is a large black ground lug (circled). There is a small screw holding it on. Use a #1 Philips to loosen the screw. Strip the other end of the CD-ROM wire and tuck it behind the plate that the screw is holding on, then retighten.

Key on the ignition to get the nav to boot up.

Switch to the audio screen and make sure the audio power is off so you see the black screen that says **"Audio Off"**. **The following will ONLY work on that exact screen.**

Now touch the far left of the screen (vertically centered), then the far right. Repeat left, right, left right. After the 6th touch, you'll see the diagnostic menu.

Press the Vehicle Signal Info. If you see "ON" for Parking, congratulations, you've just hacked your nav!



Proceed to reassemble your nav and bezel OR proceed on to Part 3 if you want to hack the rear camera.

PART 3: REAR CAMERA INPUT MANUAL OVERRIDE

When the nav receives a 12V signal from the reverse lights, it overrides all other visual functions and displays the image from the rear camera. This hack gives you the ability to introduce a 12V signal at any time causing the rear camera image to be displayed immediately, which is useful for checking your parking position or glancing behind you when you are towing.

NOTE: There is a somewhat undesirable side effect: since the override is done by splicing 12v into the reverse light input, switching into rear camera mode when in park, drive, etc. **causes the backup lights to turn on!** While this would limit the practicality of this function driving down the highway (say to check on your trailer), it actually helps if you want to see your position in a dark garage or a pull-through parking space at night since the reverse lights illuminate the camera image.

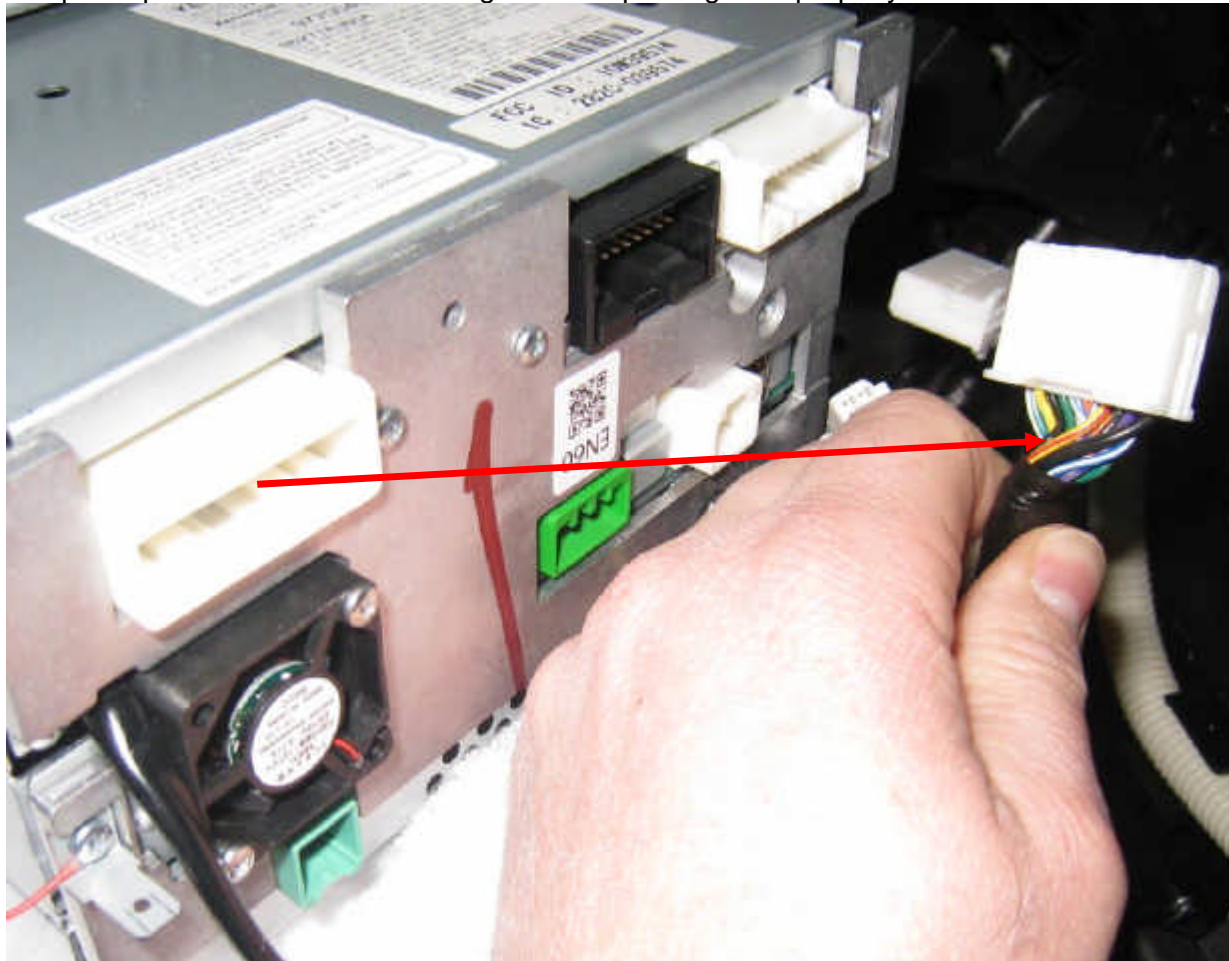
Another side-effect is that when you are actually in reverse, the light on the pushbutton switch illuminates, since the lines are in parallel. It's actually kind of cool.

This is the most difficult part that I experienced. You need to install a vampire tap into the Yellow/Red wire* (Pin #3 on connector i144), but the harness is heavily wrapped in electrical tape with metal shielding under it.

* I chose this wire because I confirmed it is a 12v ignition-switched source. You are free to use a different wire if you know a 12v source to tap into, *just make sure it is **not** a constant-power on source or else you risk draining your battery if the button is pressed while the car is off (reverse lights would be on!)*

Cut away just enough of the tape and shielding to be able to slip on the vampire tap. I found the cluster of wires to be very tight and had to work at it for a while.

Into the other half of the vampire tap, insert an unstripped 16/18 gauge wire, at least 2 feet long. Crimp the vampire tap and make sure it's strong and clamped together properly.

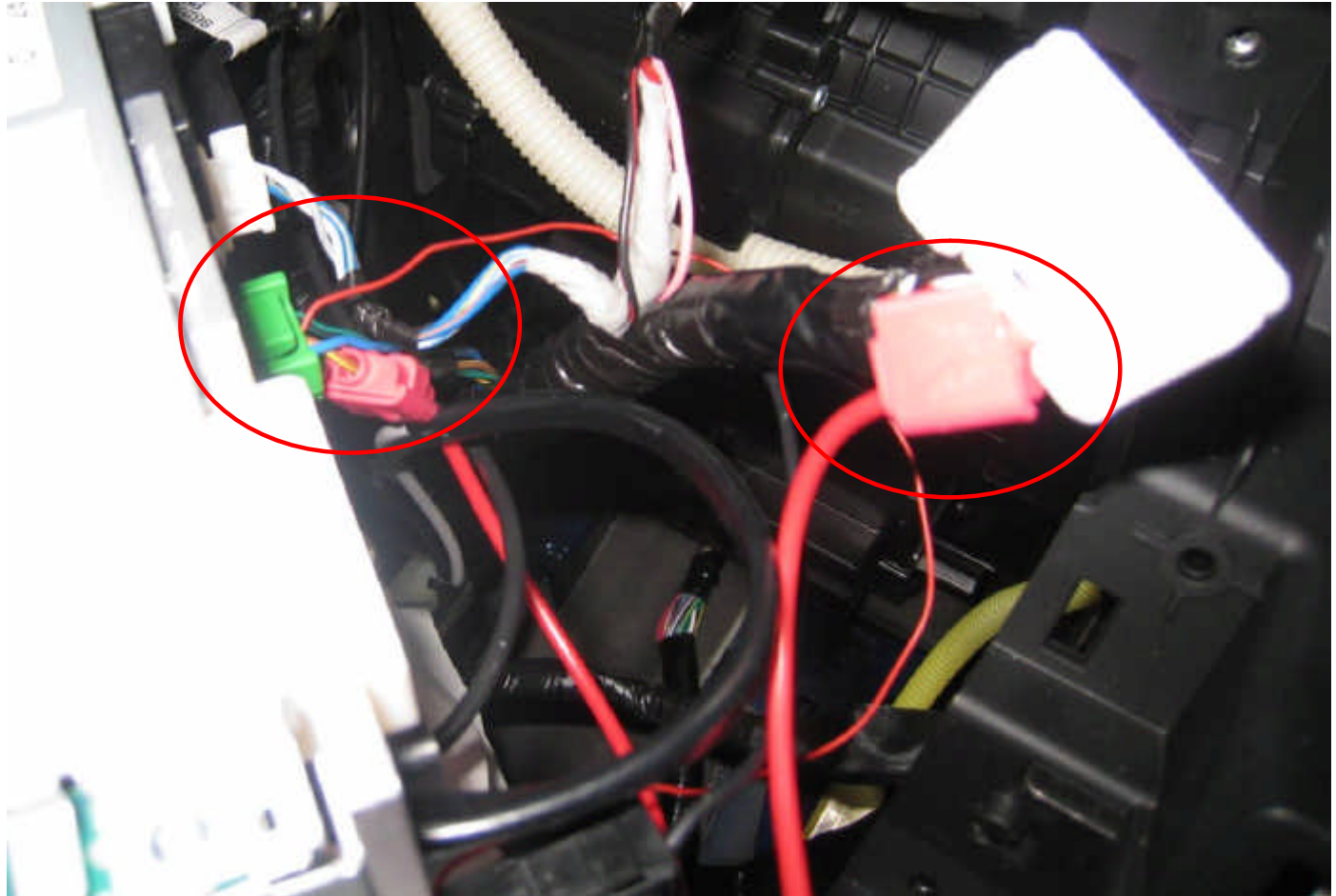


The first tap described above is shown circled on the right (below the overexposed connector).

The second tap is on the green connector, the same one that you hacked above. (You will need to temporarily remove the CD-ROM wire **and** the green connector itself to perform this step.)

In the green connector, tap into the Brown/Yellow wire (Pin#3 Connector i145). This wire is the 12V input from the rear reverse lights. Into the other half of the vampire tap, insert an unstripped 16/18 gauge wire, at least 2 feet long.

I suggest **using a different color than the first tap, or at least label the other end of the wire**, as you need to tell these apart after you fish them through the console.



Not shown in this picture – Cut a third wire (suggest black) of approx 2 feet in length which you will tap into **the ground lug behind the nav, the same ground as the control lockout override wire.**

Behind the gear shifter, pull up and out the textured rubber mat from inside the cubby. It comes out easily by prying the edge up with your fingernail or a flat tip screwdriver. (TIP: This is also a good-to-know to make it easy to clean the mat when it gets dirty.)

By removing the mat, you will expose a large opening from which you can easily access underneath the console without further removal of components.

Fish a long wire (red wire shown here) under the console and push it back towards the firewall.

Then, from behind the nav unit (which is pulled out), reach your arm down the large cavity to find the fish wire and pull it up.



Attach the fish wire in any way you desire (shown here with a large wire nut) to **three** wires, for a total of **four** wires **attached together**:

- 1) The 12v wire tapped into Brown/Yellow
- 2) The wire tapped into the reverse signal line
- 3) The third wire which you will tap into ground. (Hard to see here, but I used a black 18 ga wire for this; it's behind the red wires in the photo.)
- 4) The fish wire



Carefully pull the wires down through the cubby slot. Trim off the excess length of wire so there's only about 6" or so of slack.

Attach the **12v power wire to the red** wire on the pushbutton switch.

Attach the wire from the **reverse signal wire to the white** wire on the switch.

Attach the **ground wire to the black** wire on the switch. **At this time, make sure you have attached the other end of the ground to the ground lug behind the nav, the same ground as the control lockout override wire.**

As shown here, I secured the wires with wire nuts reinforced with electrical tape. It's probably more appropriate to use butt connectors. I suggest consulting with an automotive expert.



Bundle the 3 wires with electrical tape if desired, to keep them from rattling around under the console, then tuck them down into the console so only the black switch wire is sticking out.

I suggest you push the wires towards the passenger side, so the gearshift plastic shield does not interfere with the wires. (You will be able to see the shield looking down through the slot.)



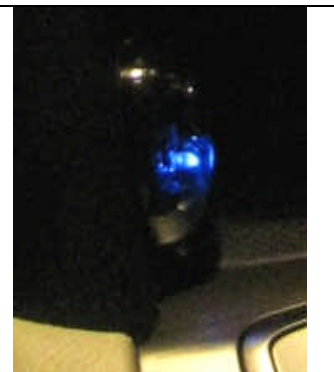
This is the tricky part that takes a little finessing—run the black wire under the rubber mat and attempt to leave just enough wire exposed so that you can wrap the wire under the switch housing, which in turn holds down and hides the protruding edge of the rubber mat.

The switch has an adhesive backing. Adhere it as shown here. If you did as good a job as I did, you will barely be able to see any visible wire protrusion and you will have succeeded at making this mod with **no drilling or cutting**. Congratulations!



When you push the button (with the car running or with the ignition on Accessory), the switch will glow blue **and your reverse lights will illuminate**. Use this feature sparingly while driving to avoid alarming other drivers (TIP: I plan to also use it to warn tailgaters!)

It will also glow blue when you place the gear selector in reverse, since it is picking up the 12v from the reverse light.



Here you can see in the orange circle that I am in Park.

But as shown in the diagnostic screen, both "Reverse" and "Parking" say "On" as a result of the mods performed here.

Down in the green circle, you can see the switch, which is activated (hence "reverse on") with the faint blue LED visible (washed out by the flash – it's actually much brighter; see close-up on previous page.)



Final Notes:

- ✧ The most useful benefit of the nav control override hack is that you are now free to change iPod album selections while in motion, beyond changing tracks within a Playlist. The inability to jump from album to album while driving made the iPod interface *absolutely worthless* in my opinion. And since the USB flash memory interface (*not to be confused with the iPod interface*) only lets you see albums in the order they were saved to the memory, it's archaic trying to find anything if you have more than a couple dozen albums, especially since it doesn't let you sort by artist or album. If you do this hack and you were using a USB flash drive – get an iPod, you'll be happy!
 - FYI, I bought a used 30 GB iPod gen 5 on eBay for \$70. I now have 250 albums tucked away in my armrest, accessible at any time by artist, album, genre, playlist, etc.
- ✧ As a result of losing power to your nav, it will lose your radio presets, all of your nav preferences, and your currently selected destination state.
 - It will remember your Bluetooth settings, phonebook, speed dial list, and all of your custom points of interest. (Whew!)
- ✧ I spent about 4 hours physically in my car to do all of the above, but it included a lot of testing and research. If you follow this guide, expect to be able to accomplish it in about 2 hours or even less.
 - If you're just doing the control lockout override hack, figure on 30 minutes. Heck, I could do that now in 10 after doing it once – pop off trim, remove 6 screws, insert CD-ROM wire, connect to ground lug, reassemble, done!
- ✧ **I spent about 5 hours creating this document for other Subaru enthusiasts. I hope it is appreciated. Please spread the word so my efforts weren't in vain.**