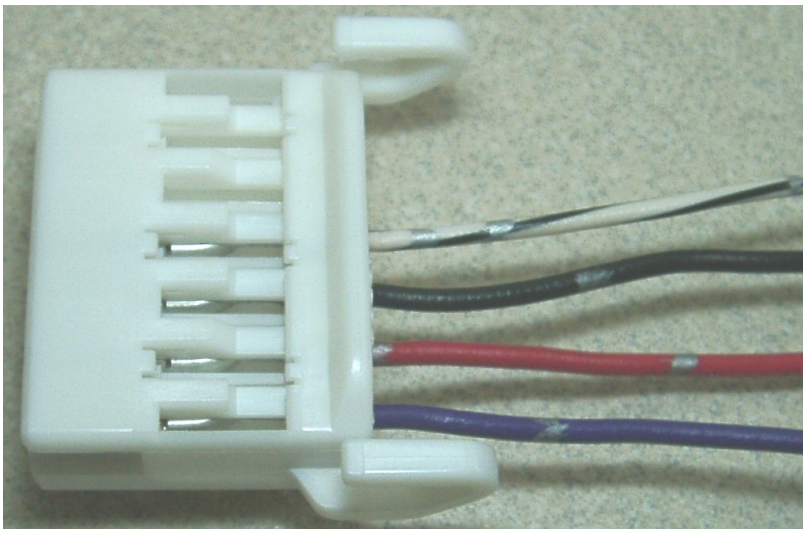
EV Button Installation with Y harness

I like to do some mods so that they can be easily reversed in the future. Sometimes wiring mods are the easiest to reverse. So when I decided to install the factory EV button available on non-North American Prius, I set out to create a Y-harness to feed power to the lightbulb in the button, and ground to it to pass to the ECU to actuate EV mode.

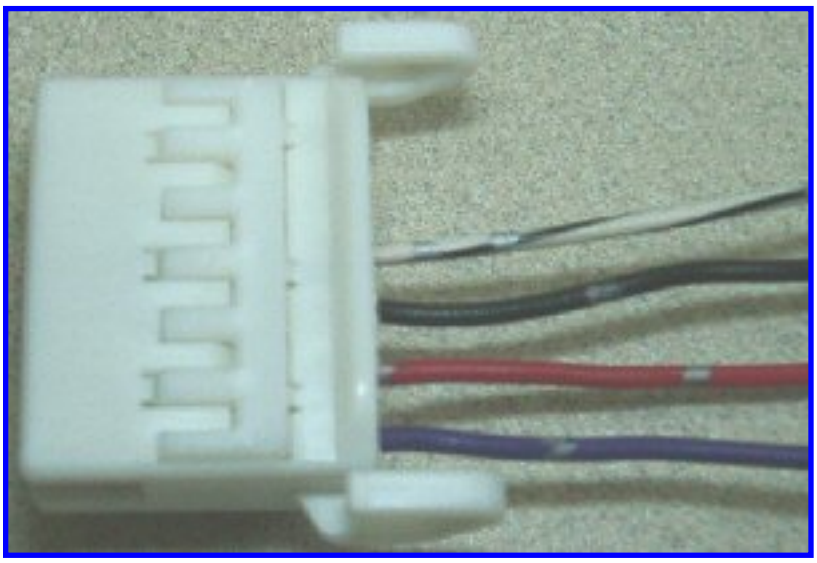
On a difficulty scale, I rated this installation as a 3/5 because you do need to know how to solder properly, and you will be taking apart a decent amount of the dash in order to run the actuating wire from the EV button to the ECU.

Start by using a pin or small screwdriver to remove the plug's terminal retaining bracket. If you look carefully at the plug, you will see that some of the notches surrounding the retainer are beveled. Pry within those notches. Work across each one, lifting the retainer a bit at a time, until it is completely loose.

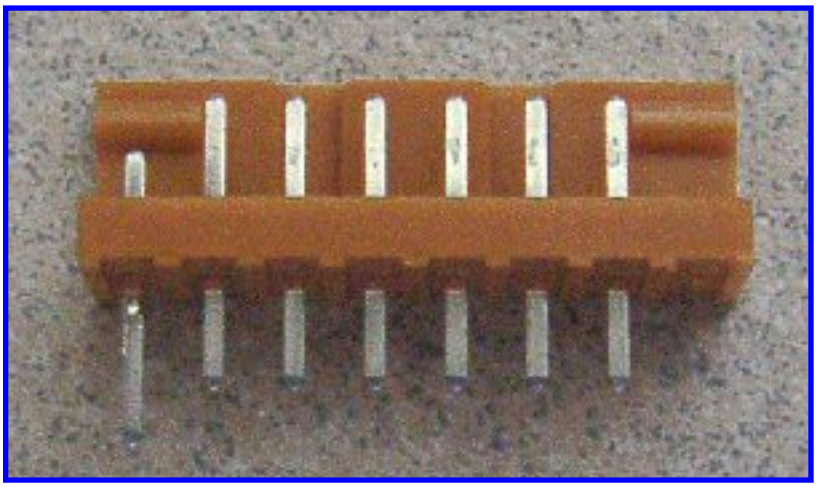
Insert the factory wires/terminals into the plug. These wires were obtained from junkyards, they come from 87-up Toyotas, I believe. Check the stereo plugs, and some of the plugs near and plugging into the fusebox, and ones behind the glovebox. Note the fins on the terminals that form-fit to the plug.



Insert 4 wires into the holes shown. If you manage to get the right colors to match the dimmer plug, they will be grey, red, black, and white/black. I used purple in place of grey for this harness.

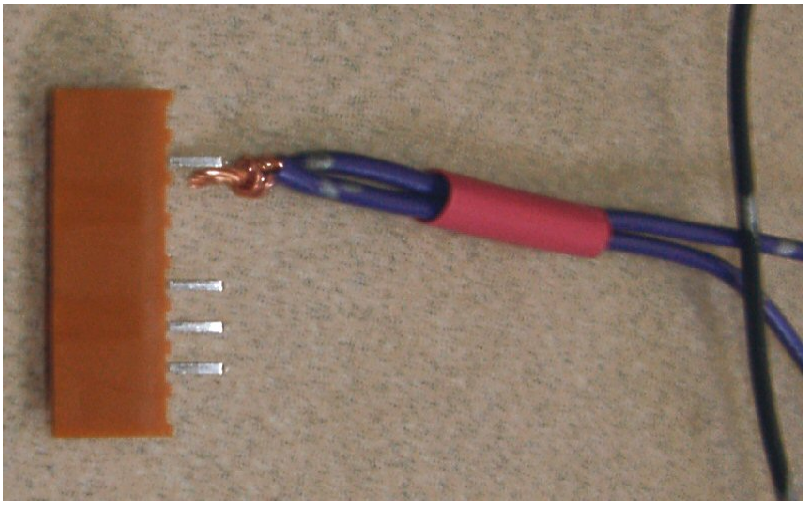


Insert the retainer, pushing it down until it locks in place.

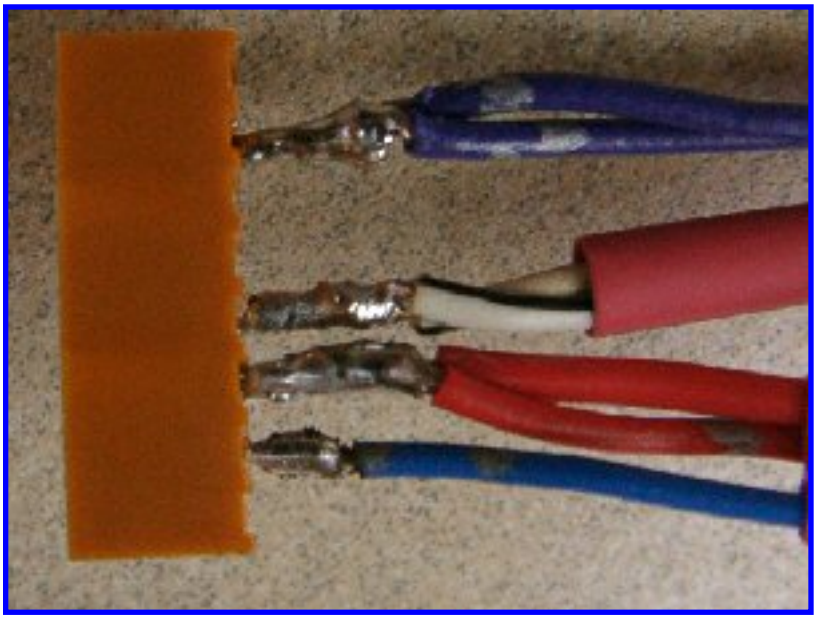


This 8-pin plug will be used to connect to the factory dashlight dimmer plug. Unfortunately, I do not have a part number for this plug yet. Since you are only using 4 of the pins, it is best to remove the others to avoid confusion. Simply press them out from the front, as shown.

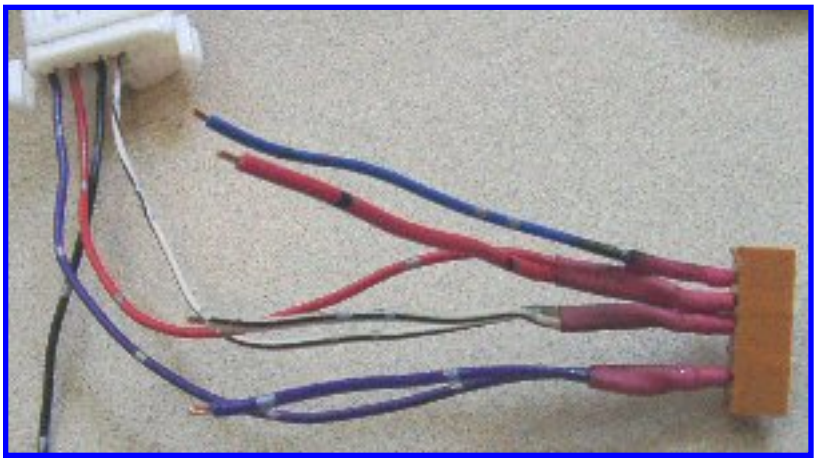
Trim wires 1, 2, and 4 to the same length. Strip about &3/8" of the insulation from the end of all 4 wires. Cut 3 pieces of jumper wire at least 3" long, strip about ¼" insulation from the ends. Wrap the stripped end of the jumper wire around the end of the EV button wire 1, as shown.



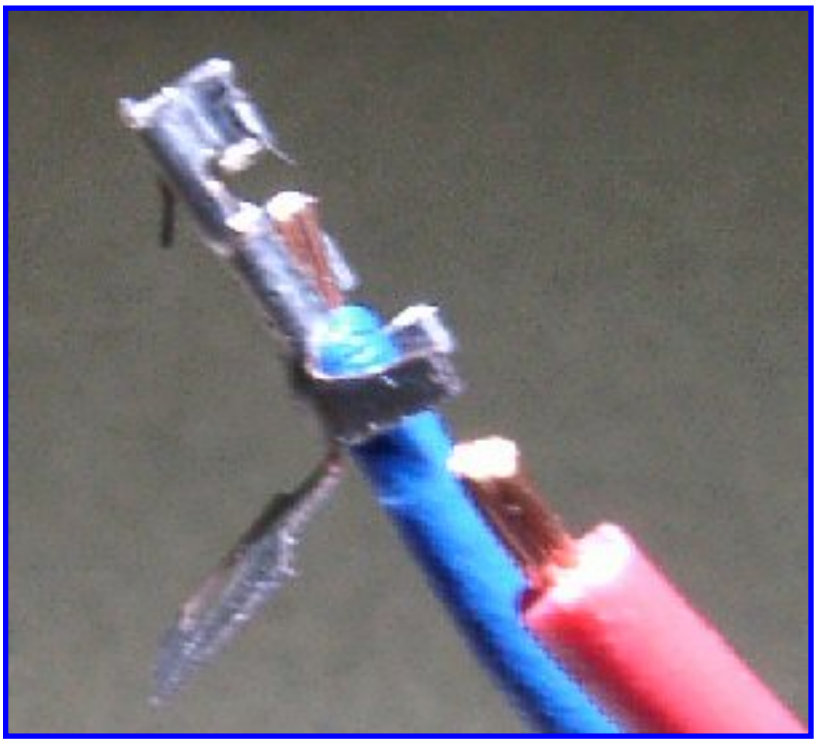
Make sure the wrapped wire does not extend all the way to the end of the EV button wire. Place some heatshrink tubing over both wires (or use tape later, but heatshrink is much better). Repeat for wires 2 and 4 from the EV button plug.



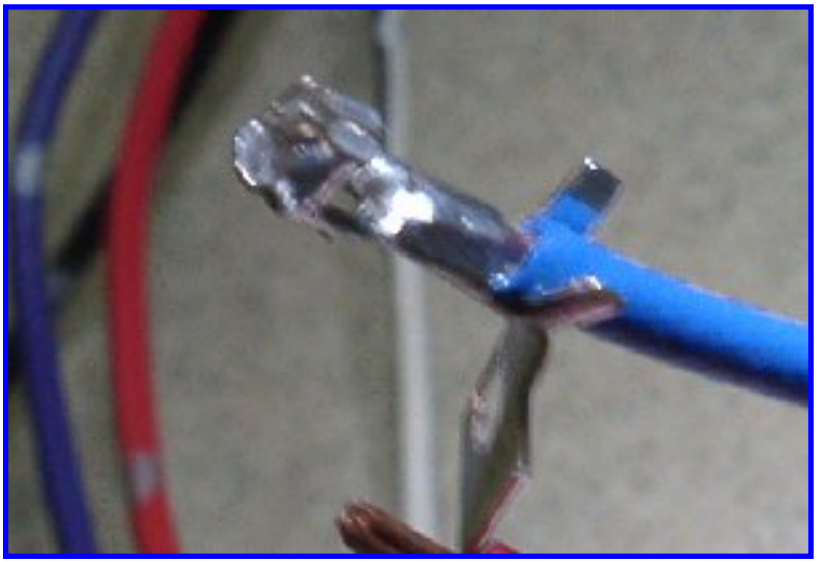
Tin the pins on the 8-pin plug (use a low heat soldering iron, or do it very quickly). Tin the ends of the wires, leaving excess solder on them. Keep them hot, then touch them to the pins on the 8-pin plug. You want to do these solder joints very quickly, or you will melt the pins loose in the plug. Note that the bottom pin has a single wire on it.



Heat the heatshrink tubing to shrink it down. Strip the other ends of the 4 jumper wires. You are only going to be stripping off about 1/16" - ***very*** little insulation.

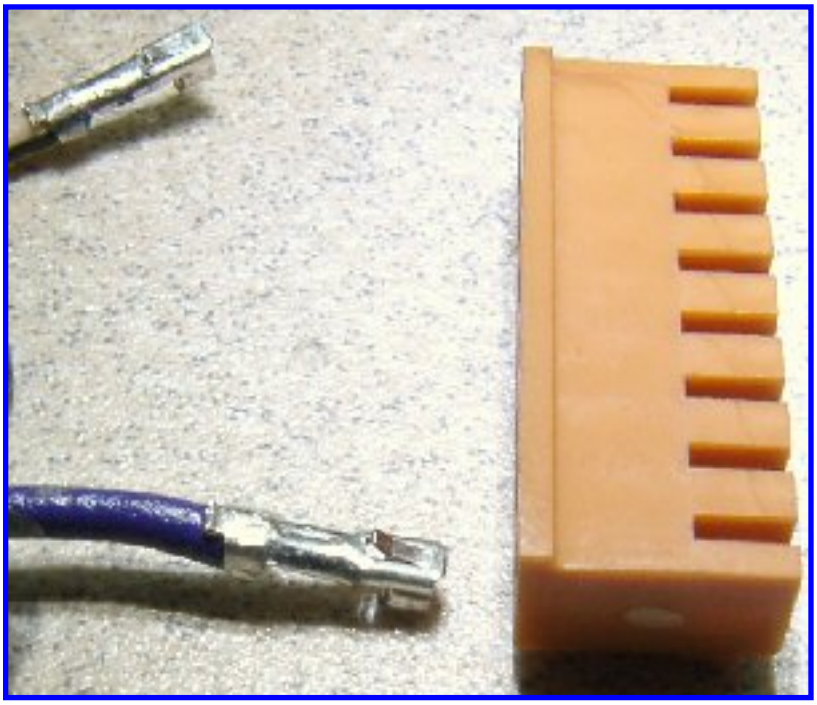


This is why you are stripping off very little. You only want enough wire exposed to fill the first crimp section of these terminals for the female 8-pin plug. Fold one flap over the exposed wire as shown.

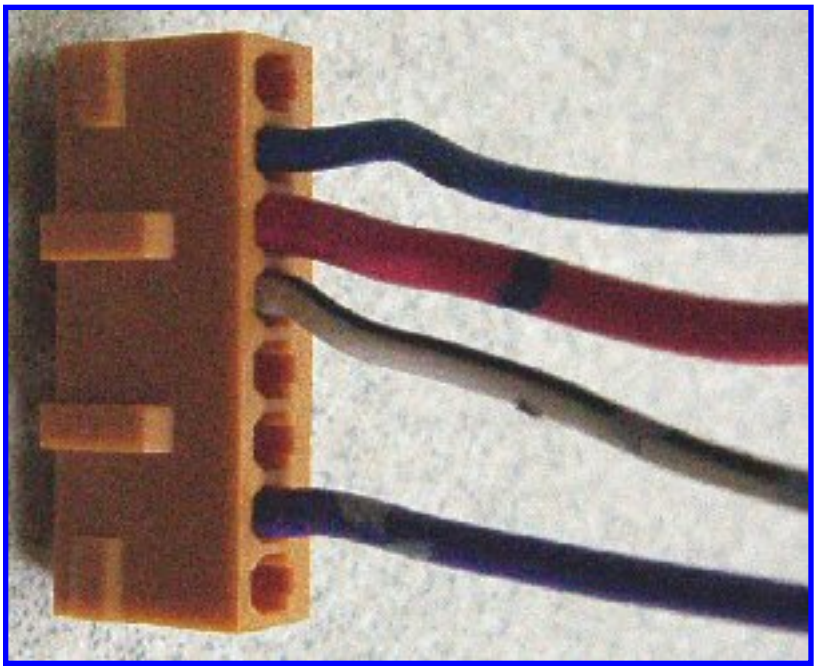


Fold the other flap over, make sure both flaps are compressed well, then solder quickly, with just enough solder to fill that junction, and no more.

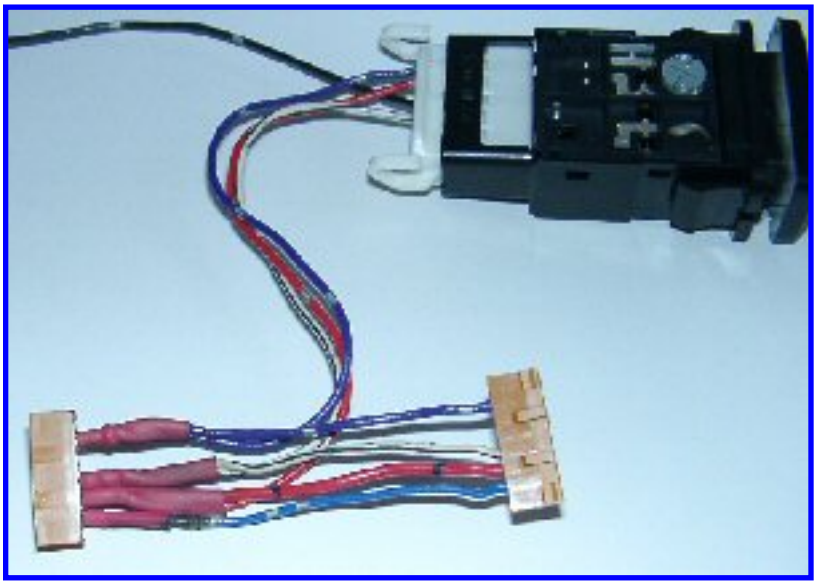
Trim the excess metal from the terminal, and fold the flaps down over the wire insulation, crimping them down tightly. You need them compressed as much as possible to properly fit the terminals into the plug.



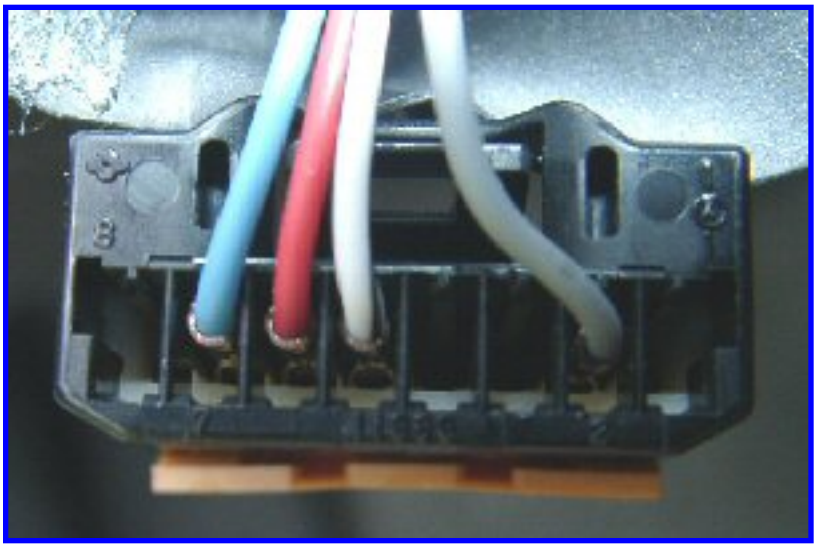
The bottom of the terminals has a tab that locks into the slots in the plug.



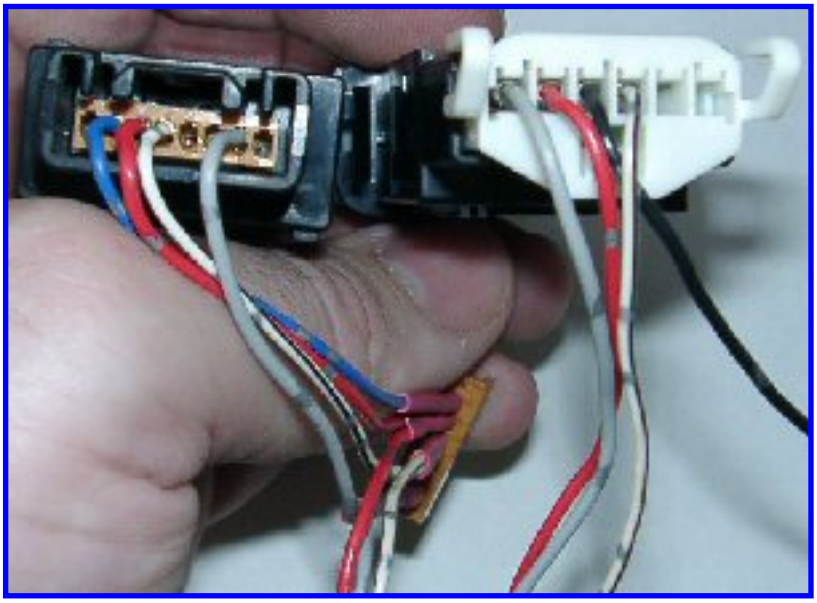
Attach all 4 terminals, then slide the wires into the plug. Again, if you are matching the factory dimmer colors, they will be grey, red, black, and white/ black. I used purple in place of grey for this harness.



Here's the finished Y-harness, ready to be installed. You can wrap the wires with electrical tape or tubing harvested from a junkyard car, if you want to make it look neater. Note the black wire at top is the one that will be going to the ECU later.



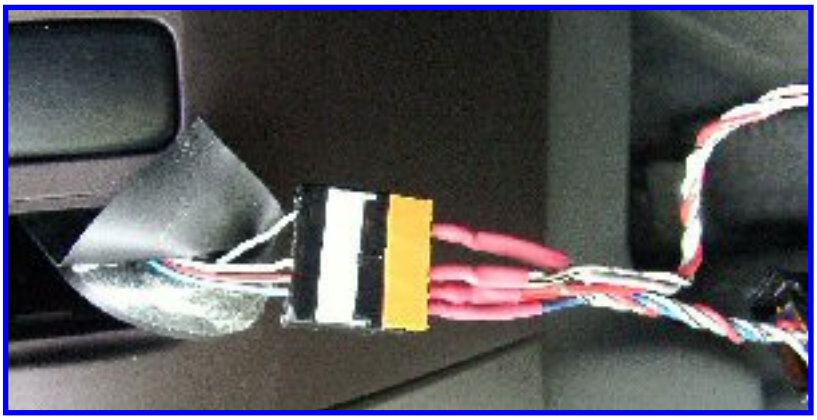
The back of the factory dimmer plug, showing the factory colors and their placement in the available 8 sockets.



The harness inserted in the dimmer and EV button. Note that this harness *does* have the grey wire.

I twisted the wires on the harness, and placed the switches in roughly the installed position for this picture.

Remove the driver's side vent panel by pulling on the top and bottom. Reach behind the dimmer switch, find the tabs holding it to the dash, and depress them. Push the dimmer out and unplug it.



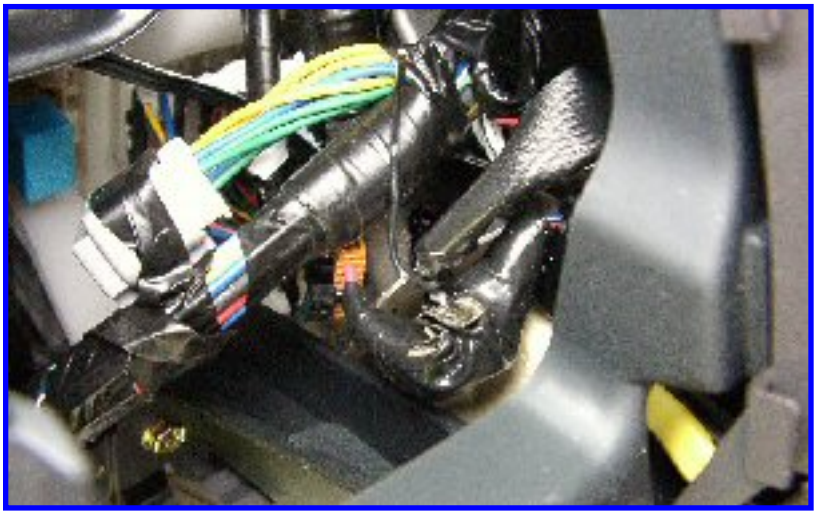
NOTE: the plug of the Y-harness is **very** hard to insert into the dimmer, as the terminals weren't really made for blade terminals like the ones in the dimmer. They do fit after working the plug into the dimmer, though. You need to push it in with a flatblade screwdriver, working back and forth across the plug, between the wires, until it is seated well and you can see the blades from the dimmer switch in the plug sockets that do not have terminals inserted.

Plug the Y-harness into the dimmer plug.

Wiretie the plugs together...but ***not*** as shown. The wiretie goes over the release tab on the dimmer plug in this picture. Then depress the tabs for the EV button blockoff plate and push it out from behind. *Make sure to save this blockoff plate in case you need it in the future.*

It's better to run the wiretie under the release tab, as shown here, to avoid pressure on it if you remove this mod in the future. Because the Y-harness plug is so hard to get onto the dimmer, I did not want to remove it, so I pulled the vent panel out to easily access the back side of this area, pulled the EV button plug through the dimmer hole, and pushed it back out the EV button hole.

Plug the EV button in, and push the dimmer and EV button into their holes. You can see the dimmer plug and Y-harness in the middle top of the picture.



Tuck the Y-harness out of the way under the factory harnesses, so it doesn't interfere with the vent panel when it is replaced, or rattle against anything. You can see the ECU EV wire in front of the dash wiring here, waiting to be spliced to a longer wire to run to the ECU to actuate EV mode.

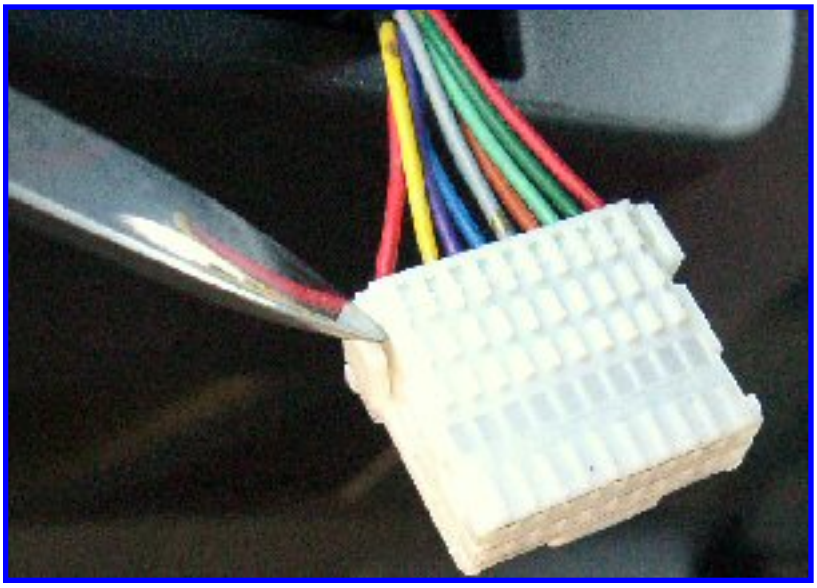
Now it's time to harvest a terminal from the highbeam flasher plug. Remove the circled screw on the underside of the steering column cover.

Turn the wheel to the left and remove this screw.

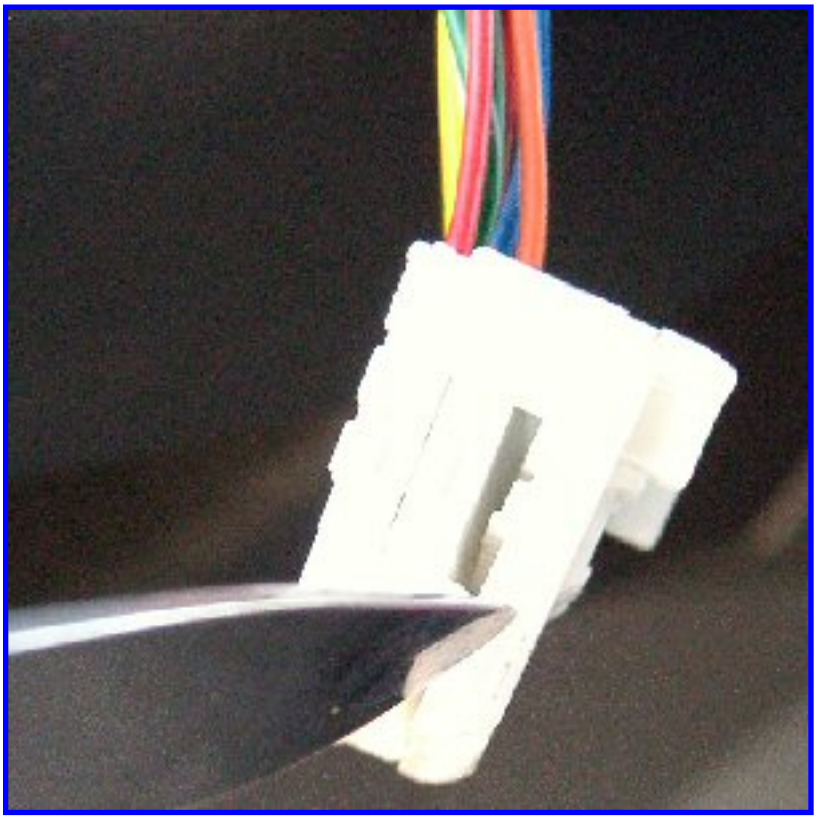
Turn the wheel to the right and remove this screw.

Pull down on the lower half of the cover. You may have to wiggle it around and shift it from side to side while pulling down in order to release the internal tabs holding it to the top half. The plug you need to access is circled.

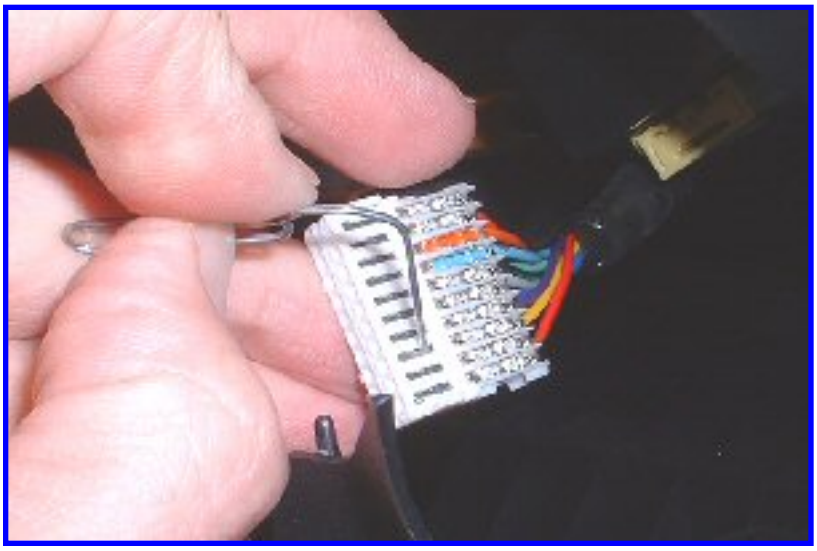
Unplug the plug, pull it out of the steering column cover so you can access it (you can't pull it very far, but



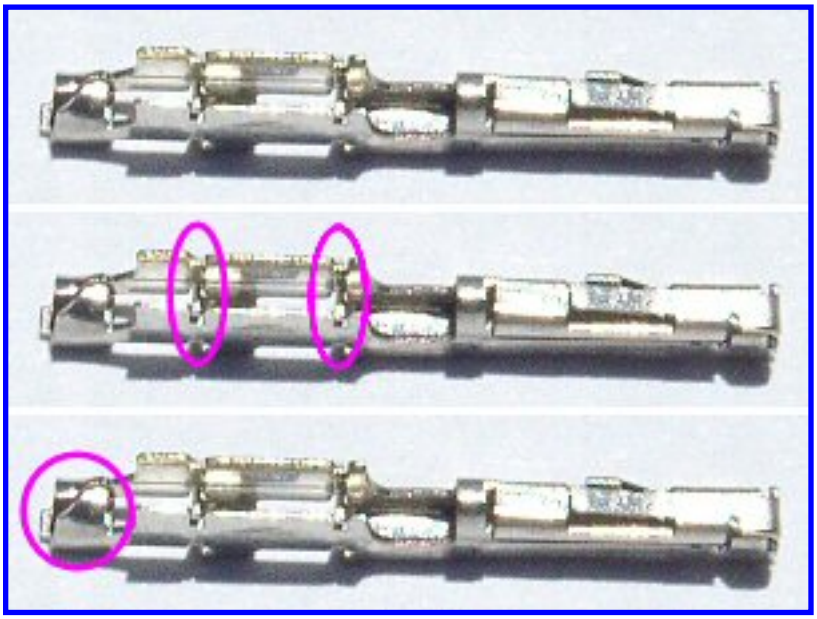
it doesn't need to be out much to work on it). Pry the larger tabs on the plug loose as shown.



Pry the top set of smaller tabs loose as shown, and the top of the plug should just fall off.



Use a paperclip, jeweler's screwdriver, etc, and depress the tab on a terminal that does not have a wire installed into it, and push it out of the plug. You can pull several and put the steering column back together, or you can do what I did, which is pull one terminal, install it in the ECU plug, and after verifying it works, then put this plug and the steering column back together.



Three views of the plug, top so you can see it with no markup. In the middle, I have circled the bayonets in the terminal that cut through the wire insulation and make contact with the wire core. At the bottom, I have circled the tabs that you bend around the wire insulation to help hold the wire in place.

The wire I used was obtained from BG Micro, its a 10-pack of 22 gauge wire. The wire has a thin enough insulation that it fits well in these terminals.

Bend the wire retaining tabs open, place the wire into the terminal as shown, and press it down into the terminal with a small flatblade screwdriver.

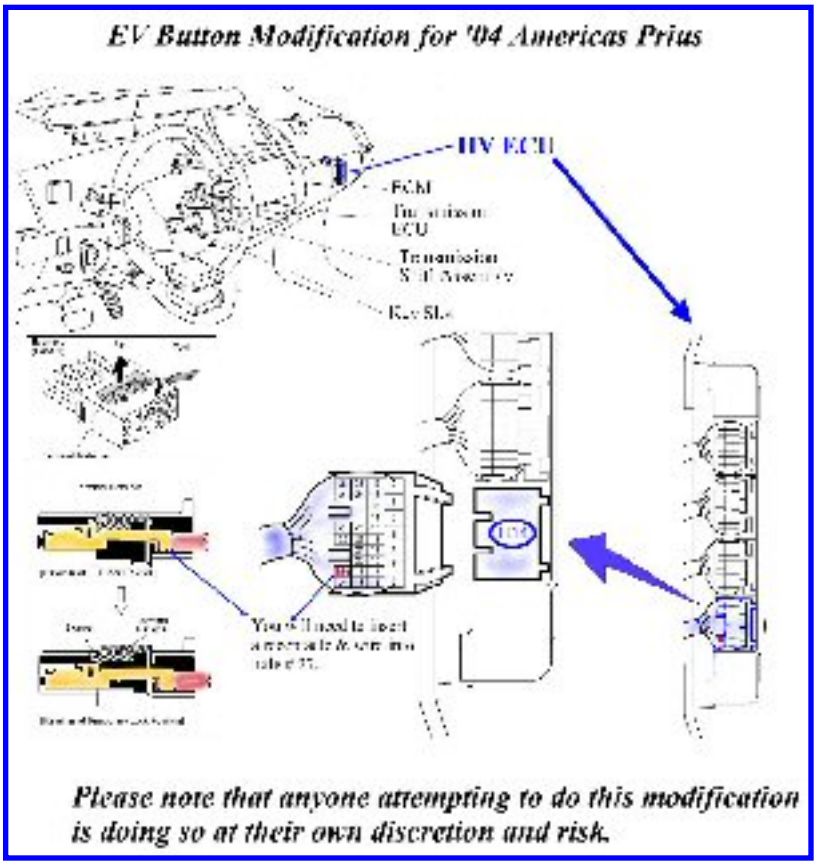
If you have a DVM (***highly*** recommended if you do any work on cars, the one pictured is only about $20 from Radio Shack, and is a pocket folding DVM), test continuity from the terminal to the other end of the wire...

...and if it tests out OK, bend the wire retaining tabs down over the wire.

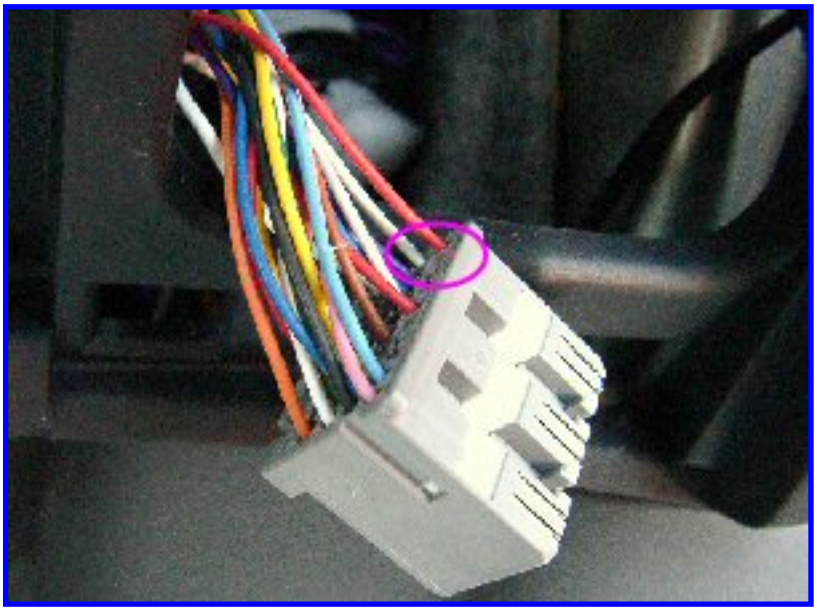
Now that you have the wire ready to insert into the ECU plug, it's time to get to the ECU. Open the top and bottom gloveboxes. On the bottom one, pull the sides of the glovebox in at the retaining tabs (upper cirle) at each side, and pull the glovebox down. Then pull the piston from the pin (lower circle), and pull the glovebox toward the seat to remove it.

Remove the right vent by pulling at the top and bottom, making sure the top glovebox is open so one of the vent retaining clips can come loose. Then remove the pictured lower panel by pulling the top loose, then pulling it toward you.

Behind the vent panel area, to the right of the gloveboxes, you'll see a ton of wiring, and several ECUs. We need the far right ECU with the grey plugs.

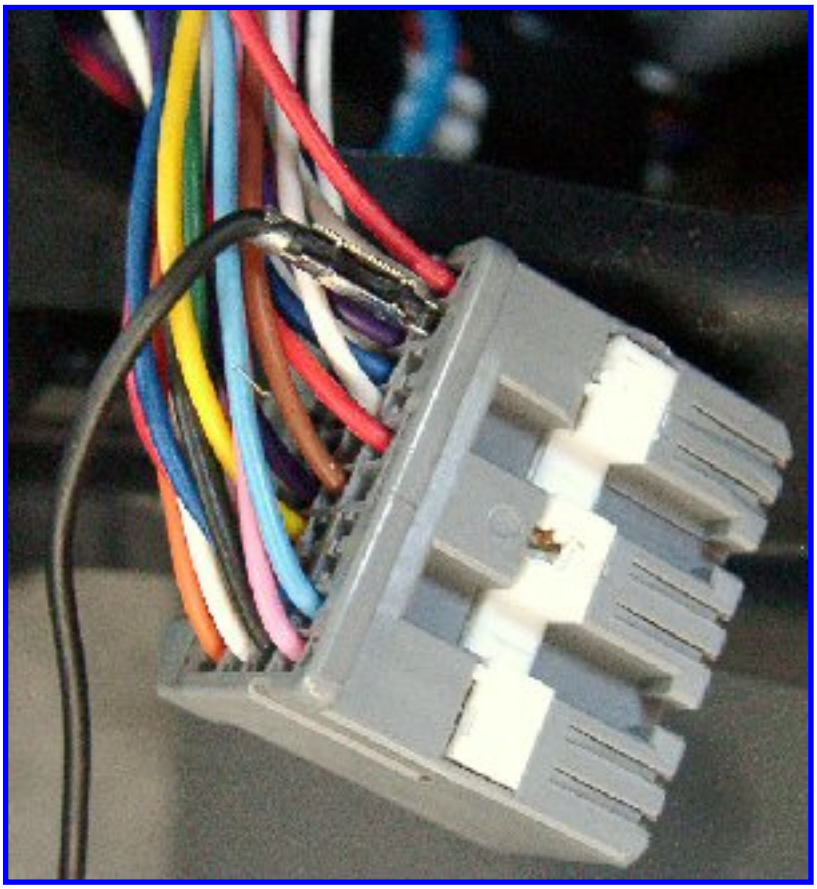


We are interested in the bottom plug, H14, specifically pin location 27, which currently is empty.

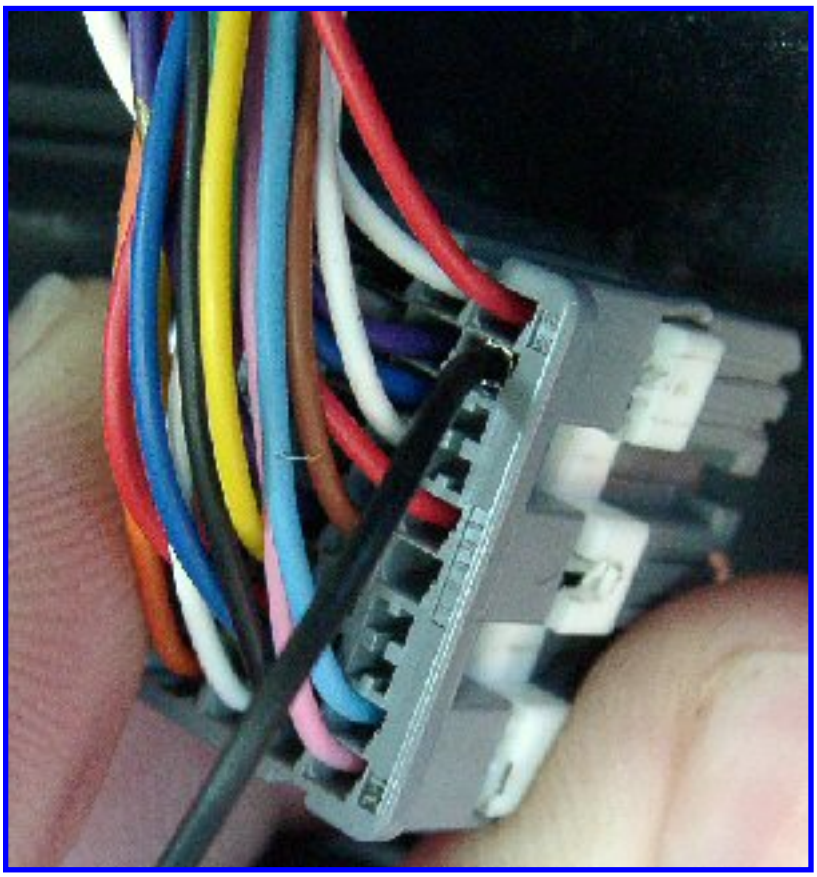


Unplug H14, and pull it out through the opening that was covered by the small bottom panel. If you orient the plug as shown, pin 27 is circled, next to the top red wire.

Use a small screwdriver, pin, etc, to raise the white terminal retainer as much as you can. It won't raise much. What is pictured is enough.



Insert the terminal/wire you assembled *in the orientation shown*. Get it into the plug by placing a small screwdriver against the bayonet blades and pushing.



Once it is in far enough that you can't push on the bayonets, push on the wire retaining tabs. Push until the end of the terminal is slightly below the level of the plug, as shown. Then push the white terminal retainer back down into the plug, and plug it back into the ECU.

At this point, it is a good idea to power up the car, get the display to Climate as quickly as possible, and rub the other end of the wire on the steel structure up near the ECU to ground it, to see if the display switches over to the Energy screen. If so, the wire is working properly, and you can continue with the install. Note that if you have a very low battery, it may not engage, but if it beeps 3 times as the wire is grounded, you still know it is working, as the ECU is telling you that the battery is too low to engage EVb mode.

Run the EVb wire up along the stock wiring harness in the route shown, using wireties every few inches to make sure the wire is out of the way and secure.

At this point, you can run the wire from the glovebox area over to the button in many ways, including taping it to a straightened coathanger and pushing it behind the MultiFunction Display (MFD). I'm Mr. Overkill, so I disassembled the dash a good bit and ran splitloom tubing, as shown in the upper left corner of the glovebox opening.

Start back over at the EV button area. Pull back on the lower dash panel as shown. Until the tab nearest your fingers on the lower panel pops loose.

Pull along the lower panel until you pop the clip near the steering column loose.

Once you have the lower panel popped out partially as shown, you can start removing the upper panel.

Pull towards you on the side of the upper panel as shown. Once it pops loose, pull back on the top of the panel and work your way to the right.

Pull on the right side of the upper panel in order to shift the lower panel out a bit.

Wedge your fingers in the lower panel and pop it outwards as you did on the left side.

Then lift the upper panel upwards and towards you, unplug the Power button from it, and set it aside.

Pull out on the top of the shifter vent panel, then the bottom, then slide it upwards to get it out from under the lower dash panel.

Remove the passenger side center vent panel by pulling at the top and bottom. Remove the MFD bolts on each side, as circled (10mm).

Pull back on the bottom corners of the MFD, above the radio, to release the clips shown.

Pull the MFD back and up, disconnect all plugs, and set it aside. Here you can see the splitloom tubing I routed from one side of the dash to the other (center, black loom, behind dash structure).

Route the splitloom (with the EVb wire inside) from the glovebox area, behind the MFD, behind the ECU shown here (above the steering wheel, and over to the EV button area, as shown in this and previous pictures.

Put some heatshrink tubing over the EVb wire and wrap it to the leftover wire from the Y-harness. Temporarily plug the Power button and MFD back in, Power up, get the MFD to the Climate screen as soon as possible, and test the EV button. If it switches to the Energy screen, Power down, solder the EVb wires together, shrink the heatshrink tubing over the solder junction, and put the dash back together.

Credits: Thanks to Evan Fusco for some of the pictures, it saved me having to take them all.

Legalese: Do these fixes/mods at your own risk. I have had no problems completing the ones that I authored, but cannot take responsibility for others' FAQs, nor for anyone screwing up a procedure listed here.

Last modified: May 26, 2004

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talonts