

# 1 Introduction

These instructions are for the installation of a Pioneer AVH-4100DVD head unit in a 2010 Prius II. There's no guarantee this will work exactly the same for other setups. Please read through the entire instructions, and button-up any questions you may have about specific steps before starting the project. Basic wiring and wiring diagram-reading skills are necessary.

**Disclaimer:** Use this document and its contents at your own risk.

The stock head unit (HU) on the package II is really slow and weak. Loading mp3 CD's and navigating directories is a true test of patience. The sound quality is OK, but, to me, it is muffled and really lacks in the low-end range. To beef-up the in-car entertainment factor, I purchased the Pioneer AVH-P4100DVD double-DIN style receiver. It does not come with navigation, iPod, satellite, or Bluetooth, but has a possible upgrade path for those features. I was primarily looking for a well powered double-DIN style head unit with a big touch screen to control my iPod, so I bought the iPod adapter add-on. There are many aftermarket head units out there to choose from.



Factory radio. Functional without the 'Fun'.



Aftermarket head unit. Wide-screen w/ many listening & viewing options.

## 2 Parts

Store	Part No.	Description	Qty	Price
<b>Toyota Double-DIN dash fitment parts</b>				
toyotapartszone.com	86221-52050	PANEL, RADIO RECEIVE <a href="#">(note 1)</a>	1	12.53
toyotapartszone.com	86221-52060	PANEL, RADIO RECEIVE <a href="#">(note 1)</a>	1	12.53
toyotapartszone.com	55405-47080	PANEL SUB-ASSY, INST	1	60.38
<b>Parking Brake DVD Lock-Out Bypass (optional)</b>				
Amazon / iPodCarParts		12 VDC Tyco Relay SPDT 20/30A (Formerly Bosch)	1	2.99
Radio Shack	64-3039	Female spade terminals (10-Pack)	1	2.19
Radio Shack / Home Depot		Half-meter long stranded 18-guage wires	3	5.00
<b>Steering Wheel Interface Controller (Optional)</b>				
eBay / happylico	SWI-PS	PAC Steering Wheel Control Interfaces SWI-PS <a href="#">(note 2)</a>	1	31.00
Radio Shack	64-3053	Wire Tap-In Squeeze Connectors (7-Pack) [18-22ga]	2	1.99
<b>New Radio &amp; Install Parts</b>				
Online	AVH-P4100DVD	Double-DIN radio (aka. Head Unit HU)	1	??
Online	CD-IU200V	USB iPod Interface Cable (optional)	1	??
eBay / honestdee	70-1761	Metra 2004-2010 Toyota Prius Radio Wire Harness	1	7.95
Radio Shack	64-3108	22-18 ga. Butt Connectors, Red (Home Depot has too)	16	4.98
Radio Shack / Home Depot	n/a	4" Heat Shrink Tubes	12	4.00
<b>Tools</b>				
eBay / 3xjacks	n/a	Nylon Car Interior Trim Panel Removal Tools (optional)	1	19.99
Radio Shack / Home Depot	n/a	Wire Cutters / Strippers / Crimpers	1	15.00
Radio Shack	n/a	Soldering Iron & Flux (optional) <a href="#">(note 3)</a>	1	15.00
Lowe's	PC1500HG	Porter Cable Heat Gun 1500 Watt (optional) <a href="#">(note 4)</a>	1	39.99
<b>NOTES</b>				
<p><b>1)</b> This was necessary, since the Surround, 55405-47080, is wider than the standard double DIN head units. As an alternative to the Toyota side trim, you could go with Metra 95-8202 (Toyota DDIN Kit 00-up). Some people have found fitment issues with the Metra parts not lining up with the HU mounting holes properly.</p> <p><b>2)</b> This part number is specific to Pioneer and Sony head units, but PAC makes devices for other brands.</p> <p><b>3)</b> Not required if making all connections with butt connectors &amp; tap-ins.</p> <p><b>4)</b> If using heat shrink tubes over the wire connection points.</p>				

### 3 Preparation for Install

#### 1. Purchase or locate all necessary parts & tools.

#### 2. Connect the head unit wires to the Metra harness wires

Solder the Metra harness wires to the head unit wires, covering them with rubber shrink sleeves. Or use red butt connectors (for 22-18 wire size) to connect all the wires.



22-18 Butt Connector



Metra 2004-2010 Toyota Prius Radio Wire Harness

There's a wire connection list on the Metra harness package. Most of the new head unit's wires match-up color-for-color to the ones on the Metra harness, but I did note the following **exceptions** for my Pioneer AHV-4100DVD:

#### Metra Harness wires not exactly matching up to HU wires:

[Harness] Orange / white (Dimmer Power)	→ [HU] Plain orange dimmer wire
[Harness] Orange / black (Dimmer Ground)	→ [HU] Ground
[Harness] Blue (Power Antenna)	→ Not used (unless car has a power antenna)

#### Head Unit harness wires not directly connecting to Metra harness wires:

[HU] Yellow / Black (Mute)	→ Not used
[HU] Blue / White (System Remote Control)	→ Parking Brake Bypass <sup>3</sup> - Relay Pin 85 <sup>1</sup>
[HU] Violet / White (Reverse)	→ Not used (Turns on rearview camera)
[HU] Light Green (Parking Brake)	→ Parking Brake Bypass - Relay Pin 30 <sup>2</sup>

#### Notes:

1. If not doing the parking brake bypass, this wire may be used to turn on an amplifier or not be connected to anything.
2. If not doing the parking brake bypass, you should attach this light green wire to the car's parking brake wire with a tap-in connector as described in the HU manufacturer's installation instructions.
3. See section 4 of this document for details about the bypass.

### 3. Pre-Wire the Steering Wheel Interface device (optional)



PAC Audio SWI-PS Steering Wheel Controller Unit

If you want to control your new head unit with the steering wheel control buttons, you'll need to install the SWI-PS device from PAC Audio. This part number is specific to Pioneer and Sony head units, but PAC makes devices for other brands.

Installation is a bit unconventional, but it works. You should try to make almost all the wiring connections before installing the unit in the car, since you'll need room to work and be organized. The 3 connections that tie directly into the wires leading to the back of the car's 20-pin wiring harness are the only ones that can't be done ahead of time.

Do NOT rely on the included paper instructions to get you through the installation. They'll create more questions than they'll answer. Instead, go directly to the PAC Audio website, and use the instructions for the 2010 Prius. They are much clearer and easier to follow.

<http://www.pac-audio.com/SWI/SearchSWIGuide.aspx>

The installation instructions from the PAC site state (also see my wiring illustration below):

The SWI-PS's wire color we are going to use is White. This is the White wire on the SWI-PS, not the vehicle! The other wires on the SWI-PS, green, yellow, orange and blue wires are not used for your Toyota Prius. This leaves you with a Red, Black and two loop wires. The purple loop wire does not need to be cut.

Connect pin 6 wire to ground. Connect pin 7 to the INTERFACE's White wire. Connect one end of a **560 ohm** resistor to pin 8, then connect the other end of the resistor to the INTERFACE's white wire. So basically you will have two wires, one with a resistor in series, connected to the INTERFACE's White wire.

Black wire: Connect the SWI-PS's black wire to chassis ground. This is usually a black wire on the aftermarket wire kit.

Red wire: Connect the SWI-PS's red wire to a switched +12volt wire. This is usually a red wire on the aftermarket wire kit.

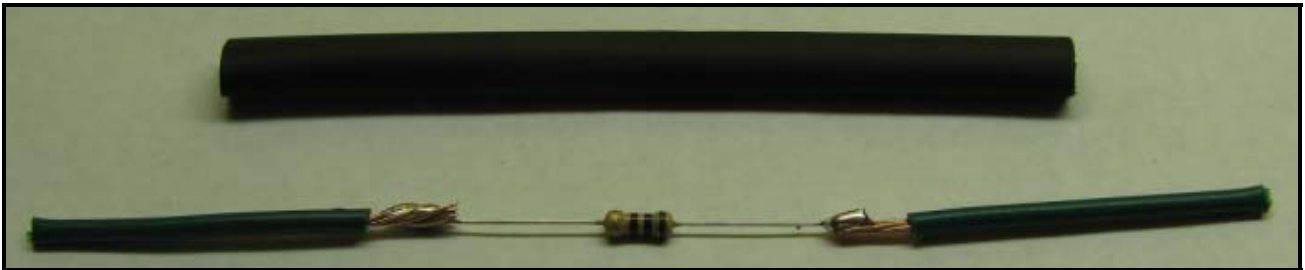
The brown loop is not cut either.

My approach to connecting the SWI-PS to the car's 20-pin harness was to not disturb the car's factory wiring in case I ever need to remove the unit. To do this, I used lots of "Tap-In" connectors, which eliminated the need to cut any factory wires. Keep in mind, these connectors work best on wires with insulation, since the insulation is what they grab onto.



Wire Tap-In Squeeze Connector

3a. The resistor's wires have no insulation, which is required to make the tap-ins securely connect. As a workaround, beef-up the ends by soldering 18 gauge wires onto either end of the resistor & put a rubber shrink sleeve on it as shown:



Solder thicker wire to ends of resistor.

3b. Attach the new resistor 'wire' to the SWI-PS white wire with a tap-in:



Connect resistor wire to white SWI-PS line with a tap-in connector.

3c. Connect the white SWI-PS wire to the head unit's red, switched power (ACC) wire.

- 3d. Connect the black SWI-PS wire to the head unit's ground wire.
- 3e. Finally, attach a spare black 18ga wire to the HU ground for use later.

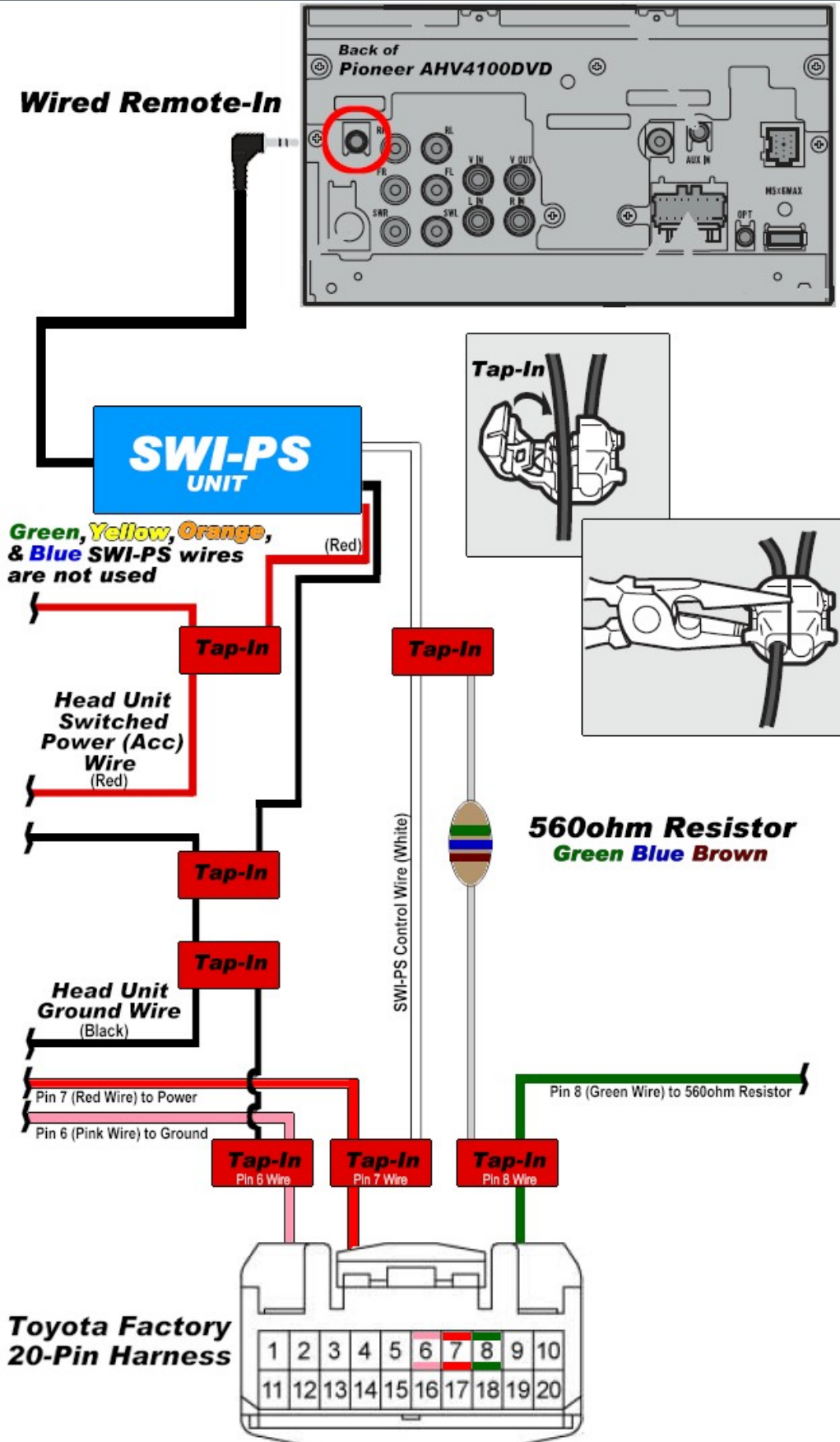
When all this is done, you should be left with a white, black & green wire – for connecting the unit to the back of the 20-pin Toyota harness later.



## 2010 PRIUS II SWI-PS WIRING DIAGRAM

Steering Wheel Controller Installation

### Wired Remote-In



## 4 Parking Brake DVD Screen Lock-Out Bypass

If you need your DVD player to play video while the car is moving, you'll need to disable/bypass the head unit's parking brake check. Some people opt to use a toggle switch to fake-out the parking brake check, but the steps below describe how to automatically trick the head unit with no manually operated switches.

### \*\* DISCLAIMER \*\*

I accept no responsibility or liability for anyone that decides to use a video source of any kind while in operation of a motor vehicle. This tutorial is for informational purposes only and is not legal in most states on a licensed motor vehicle. Do this modification at your own risk.

Parts Used in this Step:

- Standard 4- or 5-pin "Bosch" type automotive relay. If you have a 5-pin relay, you just won't use the center pin.
- 4 female spade terminals
- 2 meters of 18ga wire



Female spade terminal



12 VDC Relay

Connect the relay to the HU harness as follows:

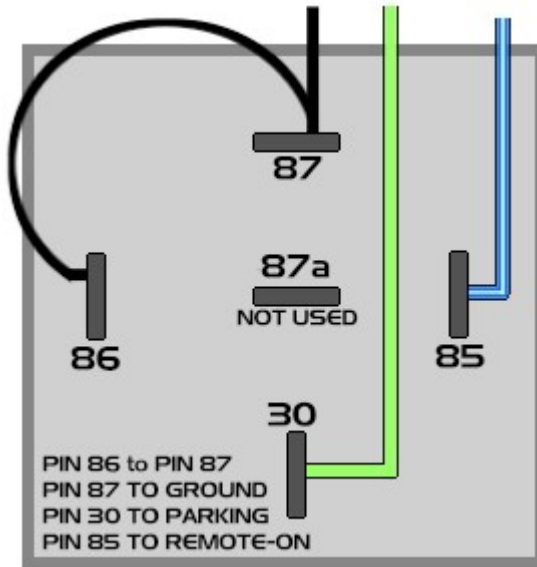
86 & 87 - Ground

85 - Remote-On (blue/white)

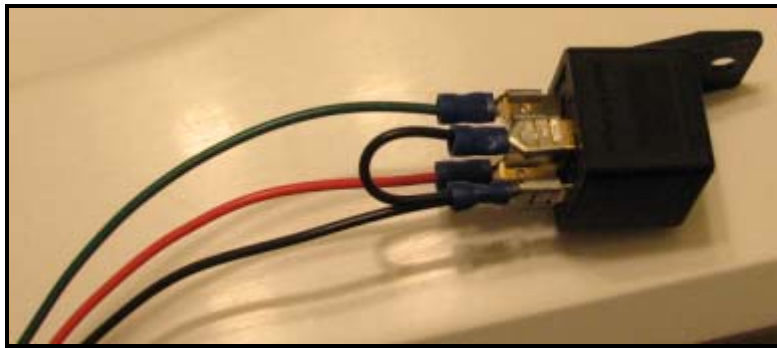
30 - Brake (Green)

Note: In the photo below, I substituted a red wire for blue, because I didn't have any blue wire available. I connected this red wire to the blue/white wire from the head unit.





Bottom View (Typical Relay) – Wiring the bypass



Note: I substituted red wire for blue, because I didn't have any blue wire available.

If you have done this correctly, the head unit should play DVD video when you turn it on – regardless of whether the car is parked or not. No toggle switch or special interface needed. I wrapped mine in electrical tape before putting it in the car.

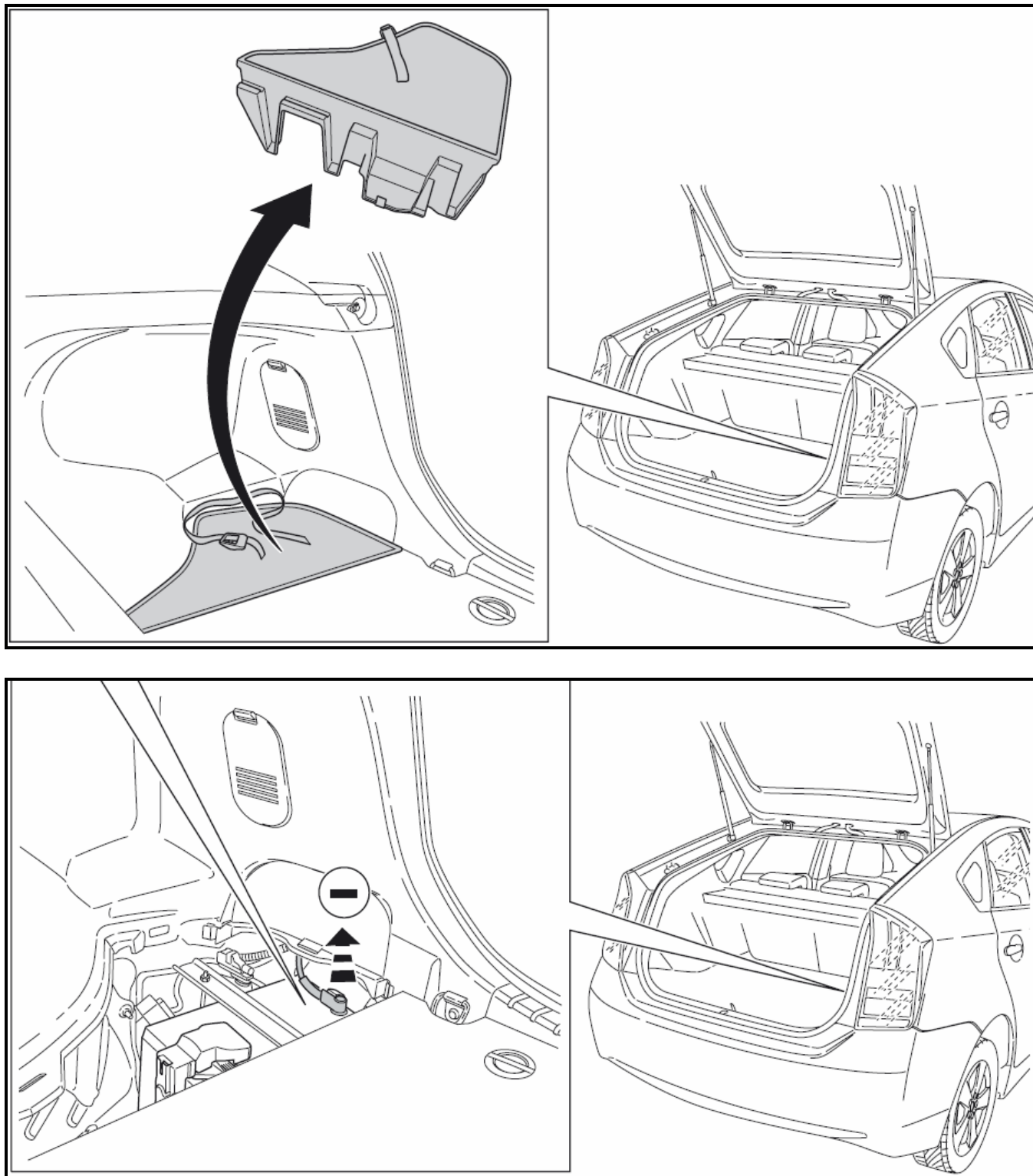
This will NOT work with some DVD players, such as Alpine, where they require a positive and negative wire to be hooked up to the parking brake *and* the brake pedal.

Here's a good video of the process:

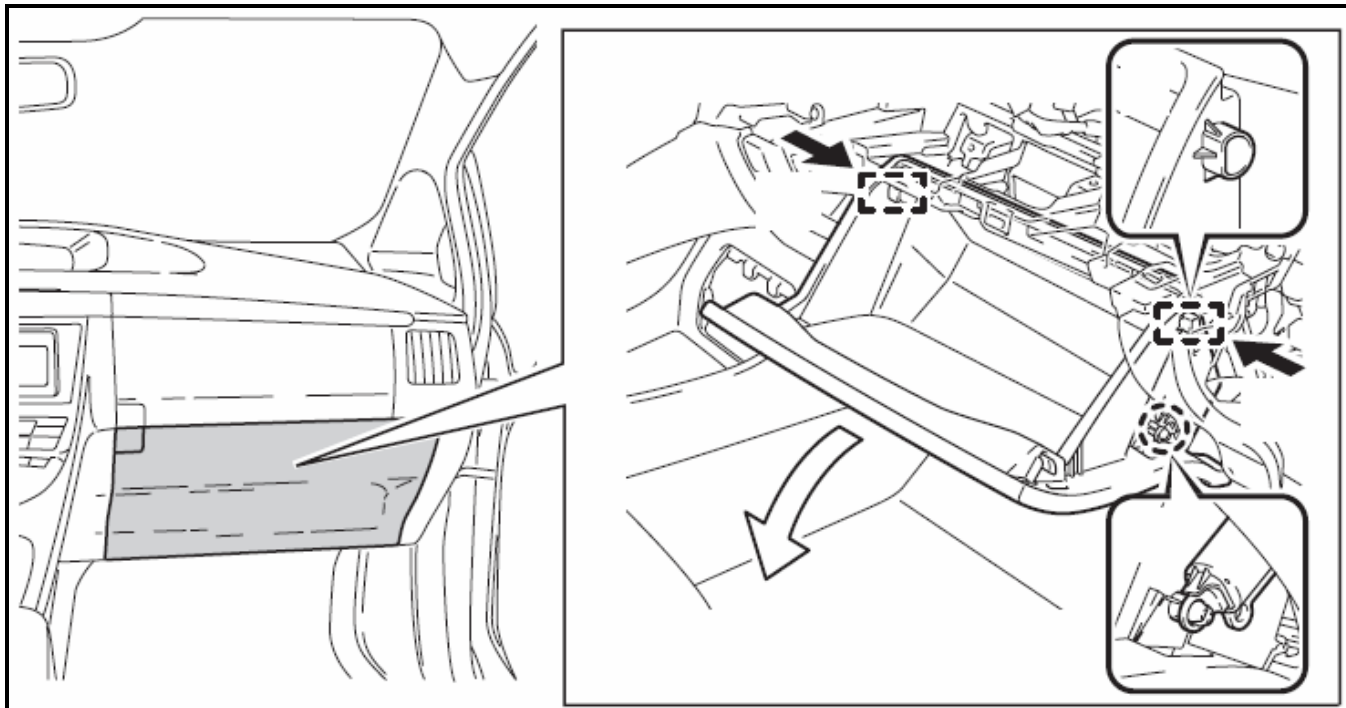
<http://www.youtube.com/watch?v=IDGZErUdRo>

## 5 Installation

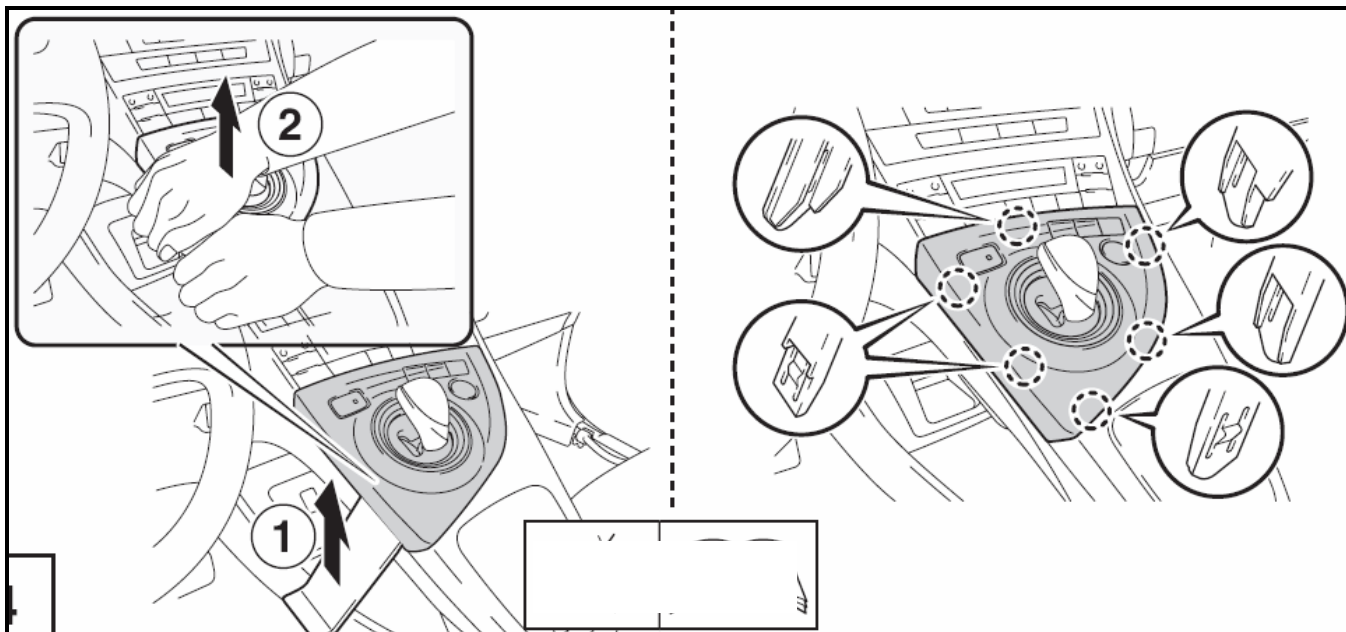
### 1. Disconnect the battery

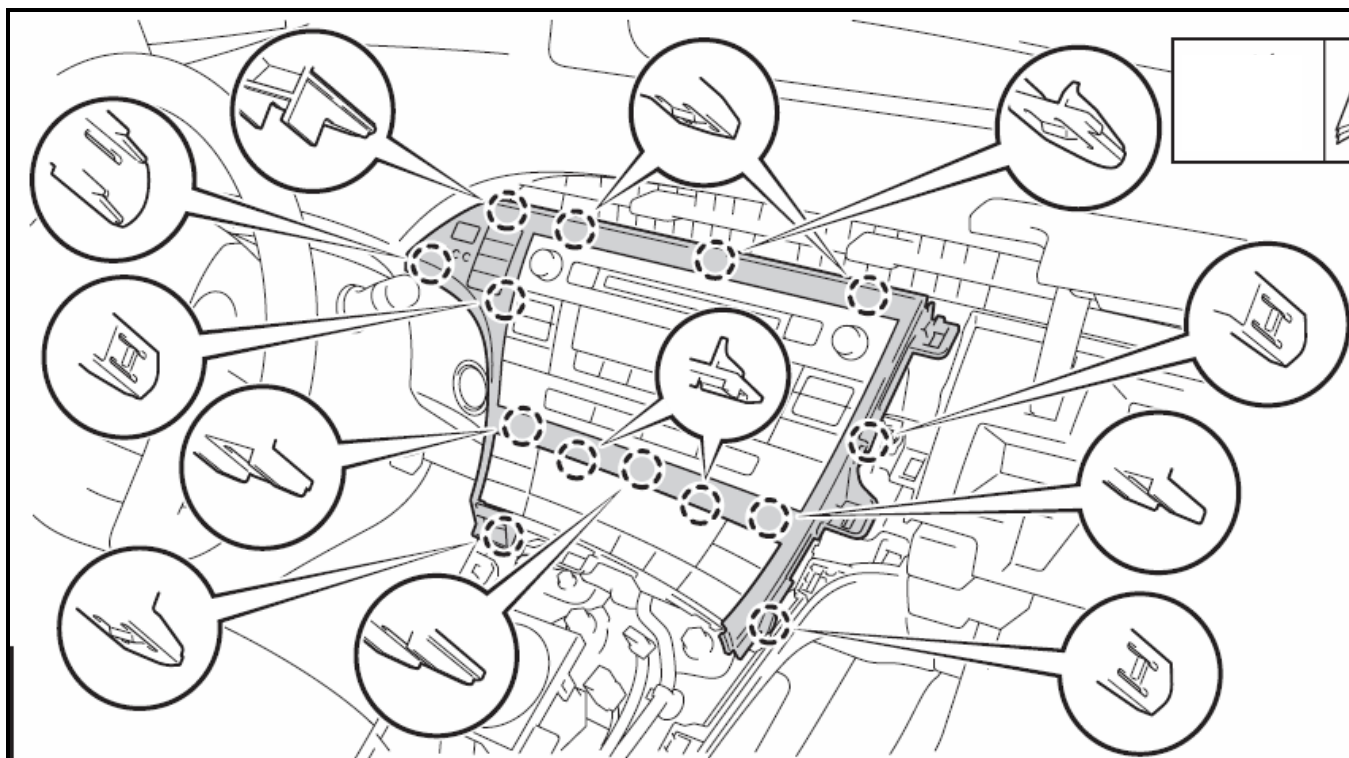
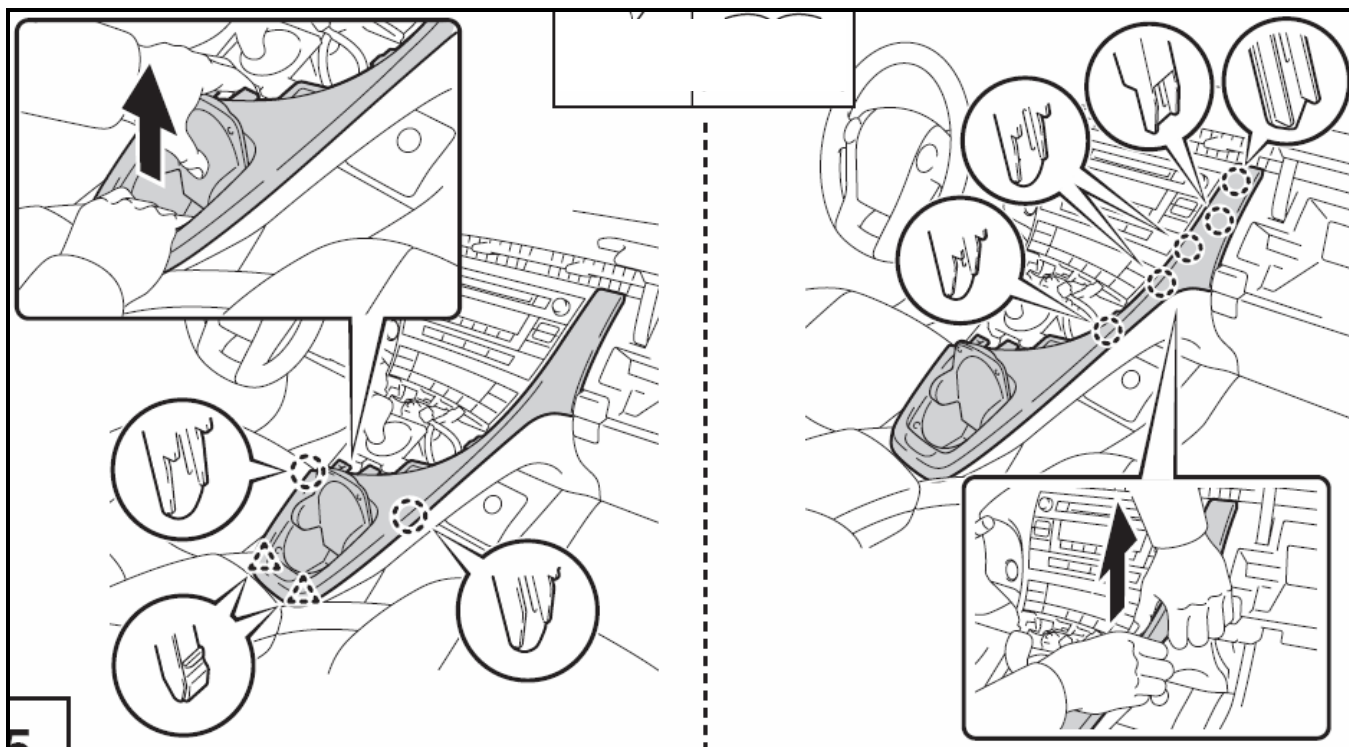


## 2. Remove Glove Box

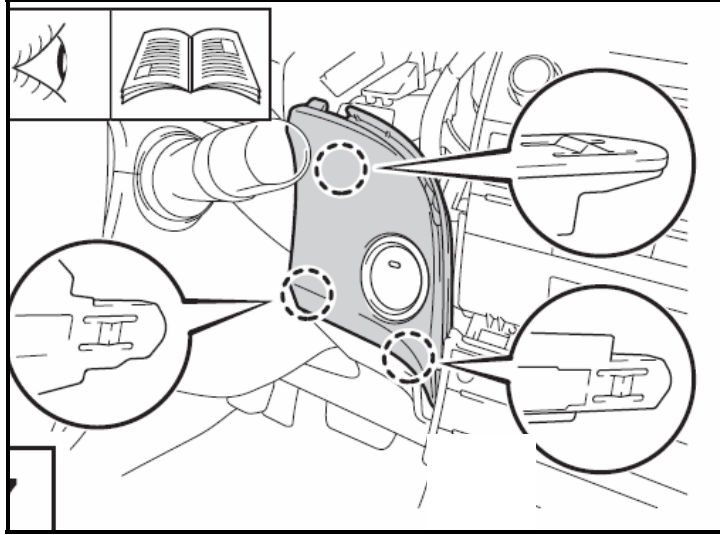


## 3. Remove Trim



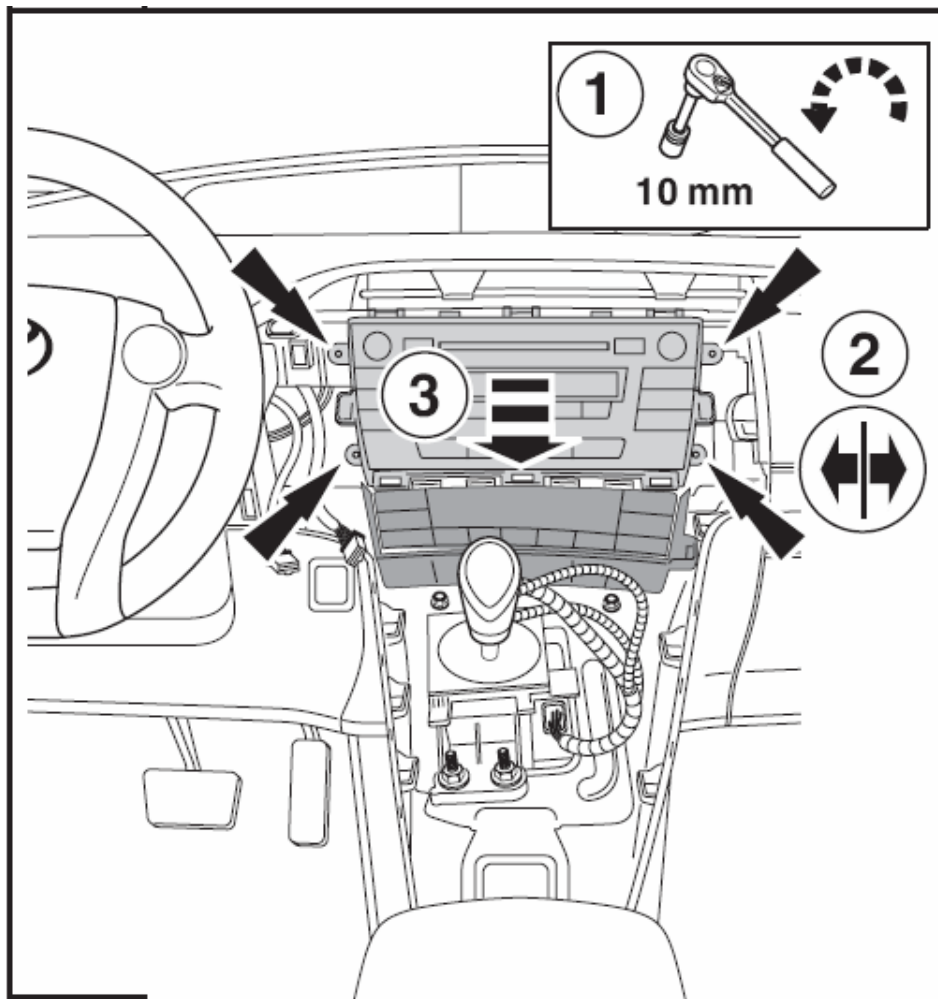


#### 4. Remove Start Button Trim

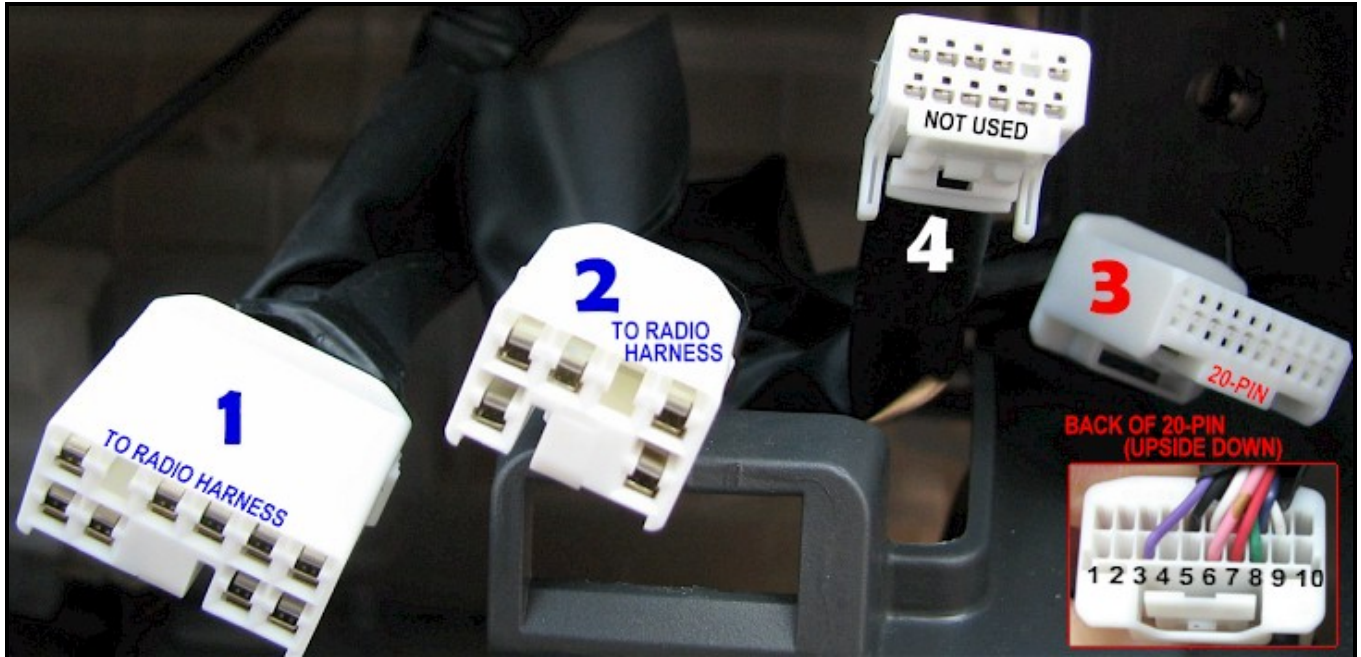


#### 5. Remove the factory radio & Unplug Car Wiring Harnesses & Antenna Wire

Remove the four (4) 10mm bolts holding the head unit brackets. Pull the head unit straight out, and unplug the wiring harnesses. There are four (4) plugs, and you depress little tabs in the center of the connectors to release them from the radio. Also remove the antenna wire.







The 4 plugs pulled from the back of the factory radio

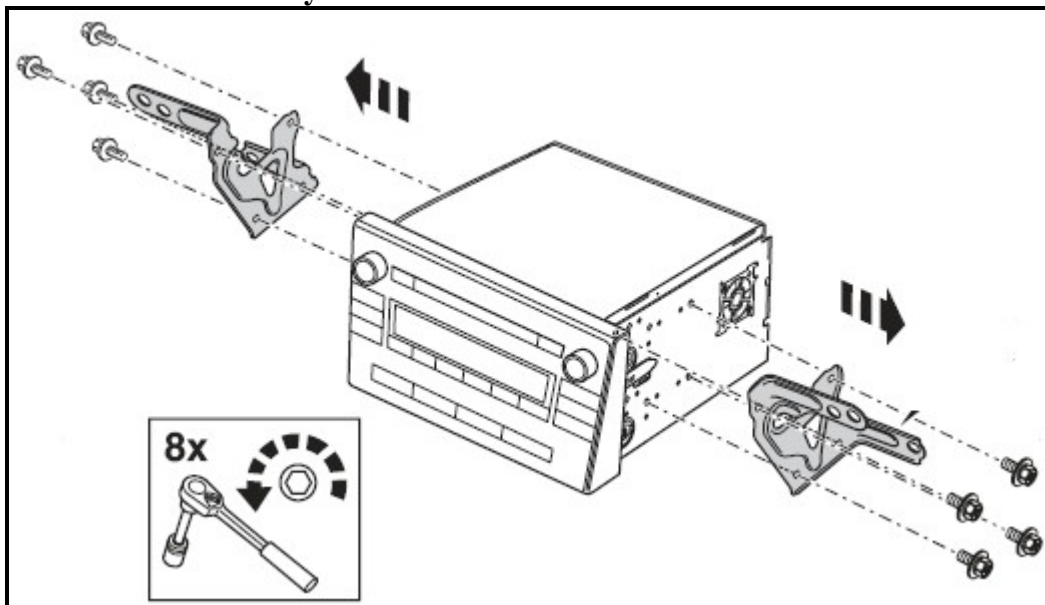
All 4 of these were plugged into the back of the factory radio.

(1) & (2) will plug into the Metra harnesses you have connected to the head unit's harness.

(3) is the 20-pin connector, to the back of which you will attach the SWI-PS.

(4) will not be used going forward. You will no longer be able to use the AUX plug in the center console under the armrest, but the power outlet is not affected by not using plug (4).

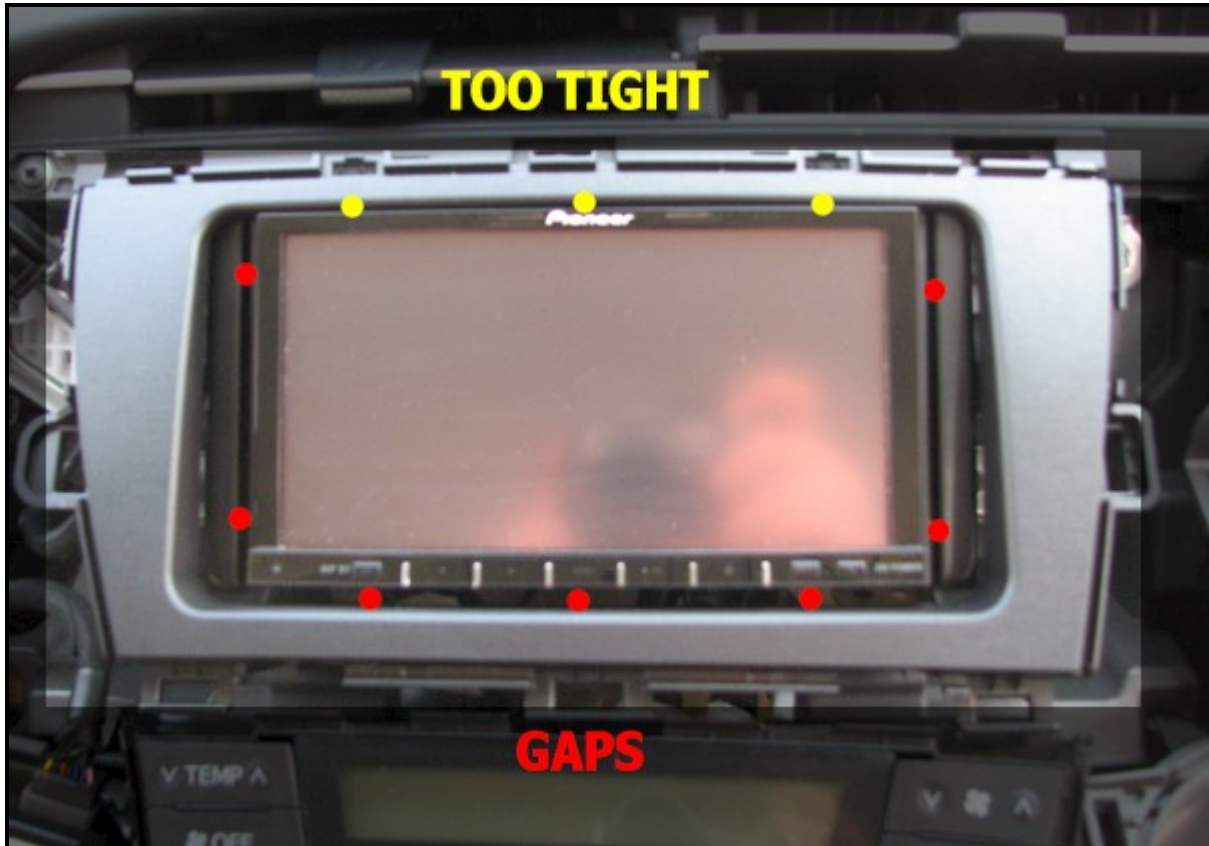
## 6. Remove Brackets from Factory Radio





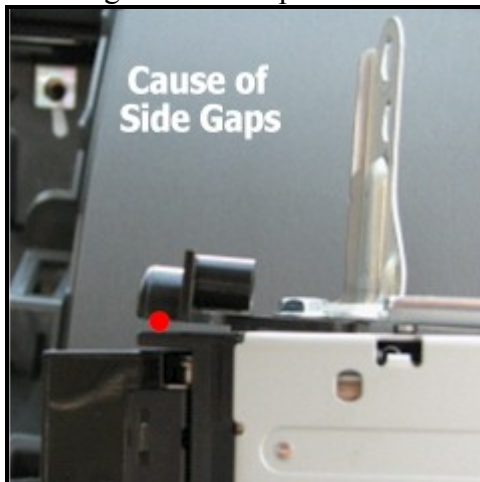
## 7. Attach Brackets to Aftermarket Radio with Side Panels and Adjusting the Mounting Position

You will see that the side brackets fit nicely into a hole pattern on the Pioneer. Screw them onto the sides with the double-DIN side fill-in panels (part #86221-52050 & 86221-52060). There are 4 dimples on the brackets that help line-up & set them into the head unit sides. 3 of the 4 screws fit into the designated mounting holes on each side. If you mount the head unit into the dash, and pop-in the new surround (Part #55405-47080), you will get an idea of how much 'customizing' you need to do on the 2 side brackets and 2 side fill-in panels. You may need none. If so, skip down to Step 8 below.



Initial fitting. Gaps can be evaluated.

The gaps on the sides are caused by the side panels not resting flatly against the sides of the head unit, so sand off the raised ridge from each panel:



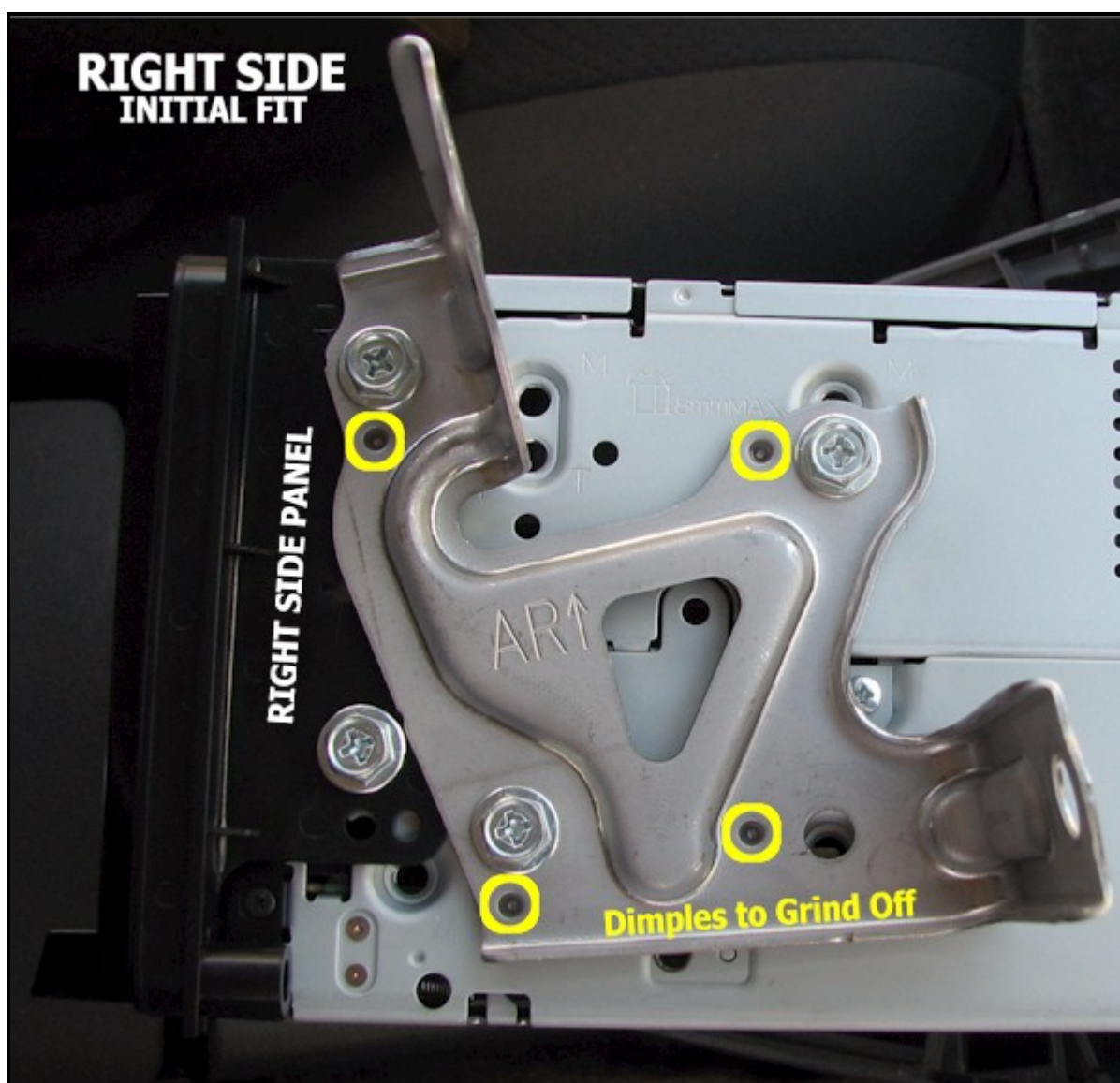


Raised ridges ground off to enable flush mounting against the head unit sides.

Note on the trim pieces:

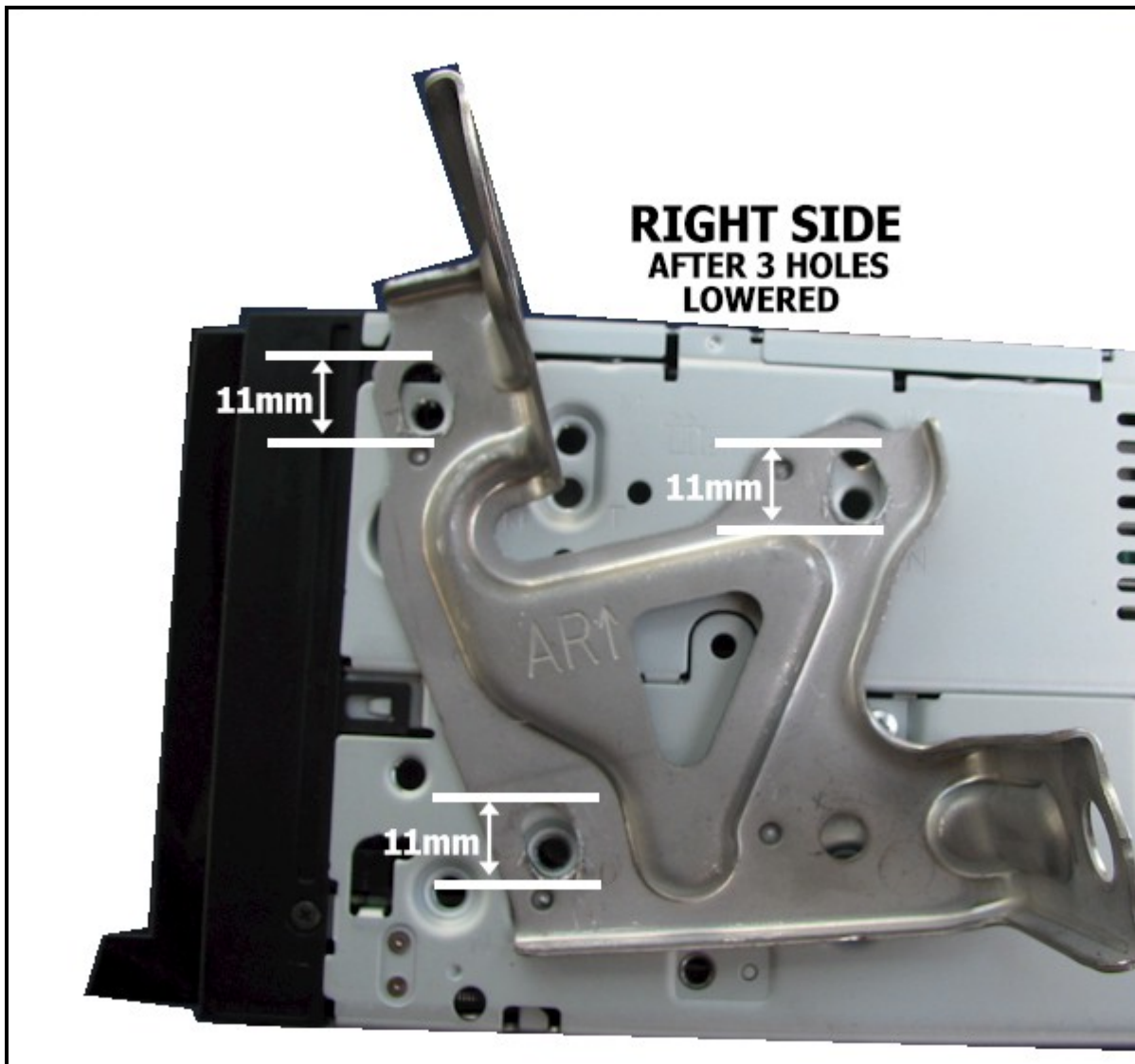
If you use the Metra trim pieces, attach them to the head unit on the outside of the mounting brackets using one or two of the mounting screws. You may only be able to get one screw hole to line up but that is all that is needed to hold the trim pieces on.

The lower gap is caused by the head unit sitting too high in the dash. To get mine to fit properly, I ground out 3 holes on each of the metal side brackets to 11mm. To clarify, these are the metal side brackets that attach to the head unit. The metal is pretty soft, but it still takes time if you don't have a fast drill with a sharp bit (or some other more appropriate tool).



Initial bracket fit looks good – until we put the head unit in the dash.

You also need to grind off or drill-out the 4 dimples from each bracket, since they will no longer line up to the little holes on the head unit.



3 mounting holes per bracket - ground out to 11mm from top to bottom.

After all the grinding is done, you may still need to insert washers in between place where the brackets meet the car. My HU sat too deep in the double DIN hole (see below), and I needed to bring it out a bit to make it flush with the surround panel.

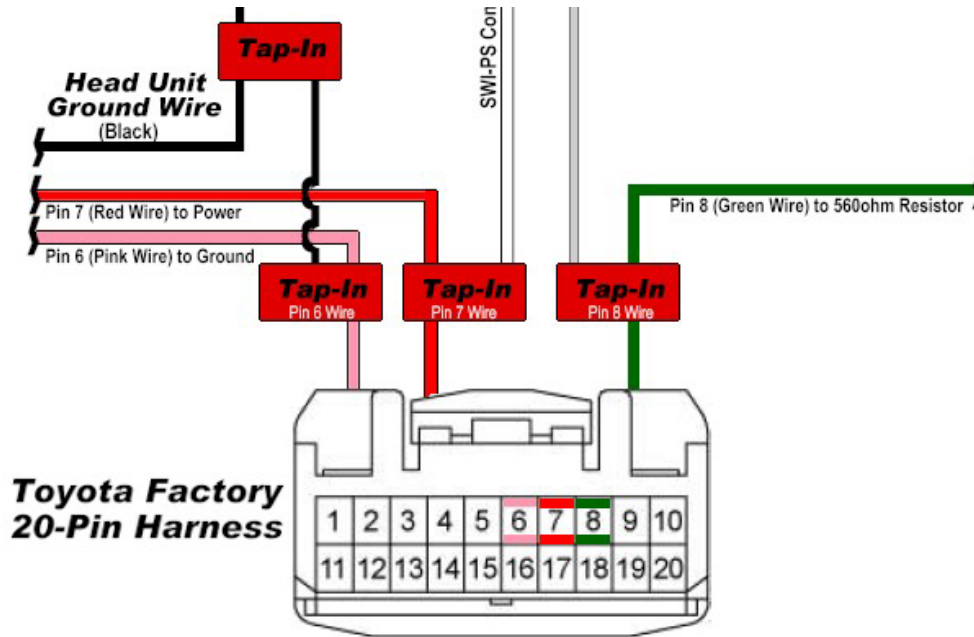




Head unit sitting too deep in the dash space.

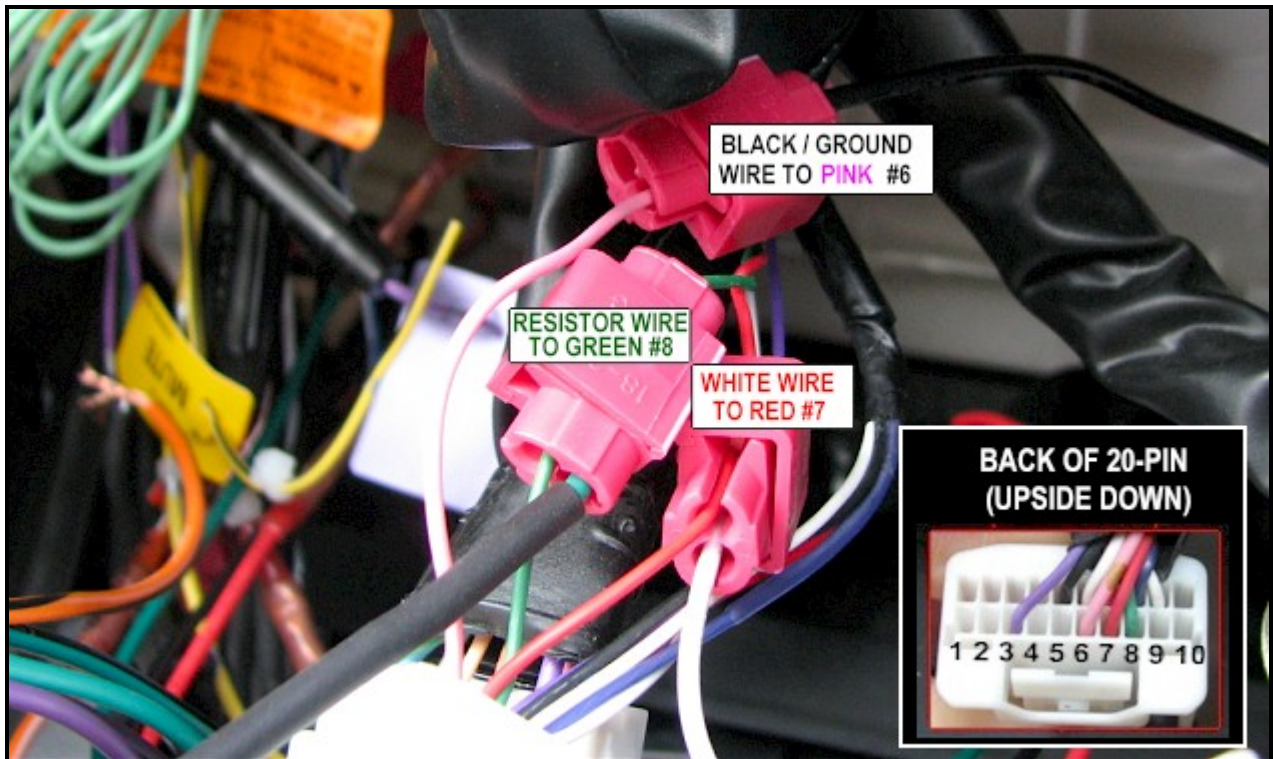
## 8. Connect Wiring Harnesses from Radio (and SWI) to Car

Now is the time to connect the three remaining SWI-PS wires to the wires leading to the back of the Toyota 20-Pin harness using tap-in connectors. This section of the diagram illustrates:



Lower section of SWI-PS wiring diagram detailing the in-car device connections.

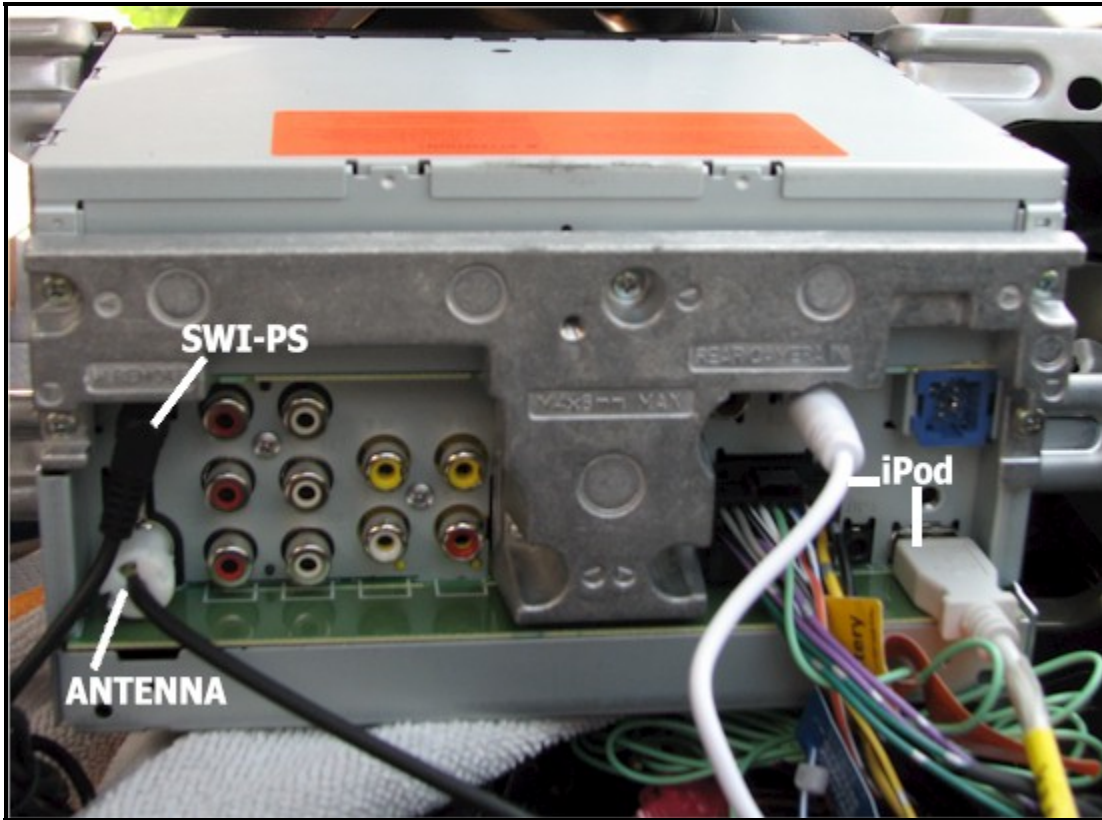
Peel back the black insulation around the 20-pin connector's wire bundle, and complete the install by making the 3 tap-in connections to the 'Pin' wires now.



3 tap-in connectors installed



Attach the 2 Head Unit/Metra harnesses to the Toyota car-side connector plugs in the dash. Attach the SWI-PS 3.5 mini-jack, iPod interface mini-jack and iPod USB to the head unit if you opted for these add-ons.

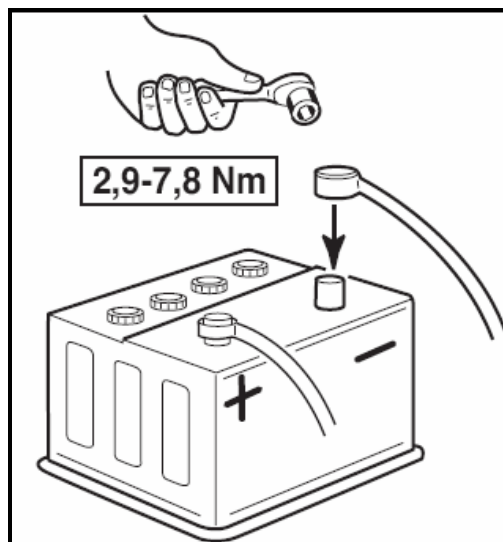


All plugs inserted to the new head unit.

**9. Mount the radio with brackets in the dash space.**

Include the washers as noted above if you need to bring the head unit forward some.

**10. Re-Connect the Battery.**



**11. Test the new head unit to ensure everything is working correctly.**

**12. Program the SWI-PS Steering Wheel Button Control unit (if installed)**

The SWI requires two people to program, since the 'learning process' requires you to be quick to push buttons on the unit & steering wheel, watch for a flashing LED, and to follow a command sequence chart (see PAC Audio programming instructions). For this reason, I chose to mount the SWI-PS in a reasonably accessible spot in case it needs reprogramming in the event the battery is disconnected again. I chose to put mine in the space to the right of the head unit, where it stays hidden behind the radio surround dash panel.

Notes:

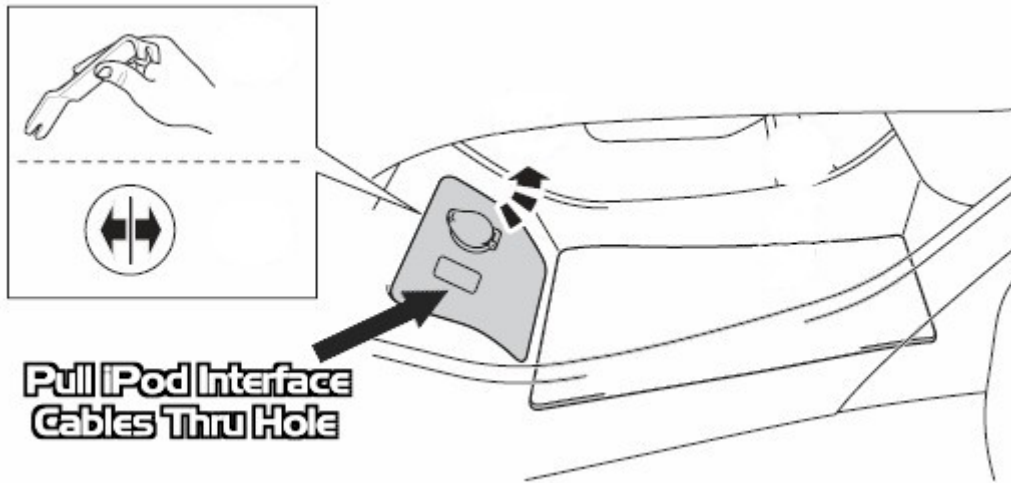
- On my SWI-PS unit, the LED is deep inside the hole on the front center. It's tough to see if you don't know where to look for it.
- I was unable to get the 'Mode' button on the steering wheel to operate the 'Source' function on the HU as it did with the factory radio. For me, 'Mode' operates the 'Band' HU function when it's in radio mode.
- If you setup the controller so the steering wheel ▲ & ▼ buttons operate the *station preset* up & down, you lose the ability to go up & down the tracks on your iPod. Setting the ▲ & ▼ buttons to operate the *tune* up & down HU functions will allow better iPod controls from the steering wheel. The iPod controls on the HU screen for my Pioneer are pretty easy to operate while driving, so I chose set it up with the steering wheel up & down controlling *station preset* up & down on the HU.



SWI-PS sits just to the right of the head unit. No rattles - so far.

### 13. iPod Interface Cables

If you opted for the iPod interface cables and need a place to put them, pop out this lower panel under the center bridge. Pop out the 'blank' plug, and run the iPod cables through the hole as noted below. The cables will just sit in the bottom tray. I've tried a couple of setups here – none of which I'm very happy with. If you have a cleaner idea for running the iPod cables, I'm open to suggestions!



Option 1: Let the cables hang loose from the plug hole.





Option 2: Drill & slice the plug & run the cables through. (The butchered left side of the 'blank' plug isn't so pretty)

#### 14. Re-assemble the dash panels.

Install the trim pieces in reverse sequence as noted in the removal section above and include the new Double-DIN surround. Make sure to reconnect the wire connectors to the appropriate trim pieces. Firmly snap the trim pieces back together checking for any gaps at the seams.

#### Note about the Battery:

If you did not disconnect your 12-volt battery, you will likely get the Master Warning icon and the message "Check Hybrid System". Assuming that there really aren't any real problems, this message will clear itself after three (3) starts (car goes into Ready mode).



## 6 Final Advice / Thoughts

Regarding the new head unit's power, I feel the stock speakers perform very well, and I'm not likely to replace them any time soon. I'm happy to see the screen dims when I turn on the headlights. Menu navigation can be a bit tricky to learn, but I attribute that to the age of the HU model. This design has been out for a few years. The iPod controls are great. I now have easy access to all my music! This HU plays AVI video, too!

It is much less stressful to make as many of your wiring connections as possible *before* you start installing the head unit into the car. You can spread the wires out on a table, take your time, identify additional supplies & tools as needed, stay organized, and do the work in small steps.

The SWI-PS was less work to wire than it was to program, and, for me, it was definitely worth the trouble. I use the steering wheel controls all the time, and they are working fine so far. I have not experienced any delay in the time it takes the HU to respond when pressing the steering wheel buttons.

Grinding on the brackets was the single step that took the most amount of time for me. You could probably save a lot of time if you had a drill press with a 1/4" bit or a Dremel tool with a grinding bit. The metal is fairly soft, and it shouldn't have been as much work as it was for me. I used a Dremel with a dull drill bit.

You can go with either the Toyota brand or Metra brand side panels. My Toyota panels didn't have any additional factory look advantage as I was hoping they would. Both brands have issues with direct fitment, and none is worse than the other.

If you plan to watch DVD's from the back seat, this shouldn't be your primary reason for buying a DVD head unit. My kids have to lean to the middle to watch video. It doesn't bother them, though – they are just thrilled to have movies in the car! I may put in some strap-on monitors for the headrests at a later date. I believe this head unit has the video outputs to support additional rear screens.

## 7 Credits

Special thanks to the folks from the PriusChat Forum helping to get this project done. Spiderman for writing the 1<sup>st</sup> instruction manual this document is based on, and ALL\_600D, kamick81, frenchie, rrolff for helping Spiderman put his guide together.

This document compiled by Aleman. Best of luck to you on your audio enhancement adventure!