

Modifying the Boxster Sound System

(Without going broke)

Like about a zillion other 986 owners, I love my 986, but hated the sound system. Any Boxster owner will have to admit that the sound system sounds more like what you'd expect to get in a \$10k car rather than a \$60k car. My Pcar is a MY03 with the M490 sound option, which means the addition of a 40 x 6 amp in the front boot and 5 ¼" tuned port "sub woofers" in the doors. My car also has the rear storage compartment option, but not with the rear speakers. I set out to make this system a respectable sound system for less than \$500. There are three problems that need to be addressed to accomplish this.

Problem #1 – you can't seriously call a 5 ½" speaker a sub woofer - tuned port or not. It simply doesn't cut it for bottom end. It was obvious to me that these had to go in favor of 6 ½" drivers. I selected 6 ½" MB Quart DKE-116 coaxial drivers which I found for \$89 a set through www.woofersetc.com. I selected these speakers because they were shallow mount depth, high quality for the price, have a frequency response starting at 40 hz, and they are readily available.

Problem #2 – The sound stage. Without the speaker option installed in the rear storage compartment, the soundstage in the car is front heavy and flat. There is no spatial image, and the sound is very directional and muddy. I realized immediately that I would be installing the PNP rear speaker kit. It is listed for \$225 on eBay as "**Porsche Boxster Rear Speaker Kit - THE Upgrade.**" The PNP kit was selected because it is cheaper than the Porsche kit, and contains much better drivers. A really nice guy named Harvey Peck sells this kit on eBay, his seller name is **sales4pnparts** there. Search eBay for "Boxster rear speaker kit" or you can contact him at: **harveyppnp@comcast.net**

Problem #3 – The stock 4" dash speakers are very flat and lackluster sounding. I decided to replace them with 4" MB Quart DKD 110 coaxial drivers, which I found for \$40 a set through www.woofersetc.com. These were selected for the same reasons as the MB Quart 6 ½" speakers – price, quality, and availability.

The Fix

Step 1 - I purchased and installed the PNP rear speaker sound kit. You need to have the rear storage shelf for this, but if your car does not have one, I have seen them on EBay and other used Porsche parts or salvage sites for \$200 or so. The PNP kit is very complete and very well documented so I don't need to add pictures or instructions for this part of the project. If you want to take a look at the instructions ahead of time, you can find them here (you will need Adobe reader) [PNP Rear speaker kit instructions](#). The kit takes about 3 evenings of work to install. It can be found on eBay by searching for "Boxster rear speaker kit".

Step 2 - front speaker replacement. The main obstacle with this mod is speaker selection. There isn't a lot of room in there below the speaker grills. On my MY03, there was a dash bracket on the driver's side, and a bolt protruding about ½" longer than it needs to on the passenger side making it pretty much impossible to mount a speaker with more than a 50mm mount depth – at least using one of the two most prevalent mounting methods. Those methods are 1) modifying the stock speaker cage/mount or 2) using a set of custom brackets that **vfxbox** makes and sells on the **RennTech.org** forums site (more on this in a bit.)

The stock dash speakers are a component set up using a 4" full range driver and a ¾" tweeter, both mounted to the speaker grill. The 4" driver is actually built right into the mount as shown in figure 1.



Figure 1

I read through the instructions on how to mount new speakers in the dash by modifying the stock speaker mount. These can be found at <http://www.renntech.org/forums/index.php?showtopic=6617> These are very thorough instructions and should be all you need IF you decide to go this route. I didn't like this method because: a) I didn't want to destroy those stock speakers just yet, and b) I didn't like having to modify the NEW speakers to have them fit a mounting that might or might not work.

Instead, I decided to use take a route that left me room to back up if I needed to. I decided to try a set of **vfxbox**'s mounting rings (figure 2 and 3 below.) These rings are a little pricy, to be honest, but **vfxbox** sells them at cost. No doubt, he doesn't make thousands of these at a time, so they do cost a bit to have made. These rings enable you to mount most standard 4" coaxial drivers onto the back of the stock speaker grills. They make the mod very simple and easy to do – and to retreat from if the need arises, because you haven't butchered any of the stock pieces. The rings are available here <http://home.socal.rr.com/vfxbox/bracket/index.html> They come with a set of very well documented and illustrated (in color) instructions on how to install new speakers into the dash using these brackets.

Figure 2



Figure 3



One word of caution – these rings mount flat to the three stock mounting posts, unlike the stock mounting which “drops” the speaker (when viewed upside down out of the car) about 5mm to 7 mm (1/4”). (see figure 4) Because of this, the speaker’s effective mounting depth is increased by that amount. You will need to take this into consideration when selecting speakers. You can either make sure that your speakers have an effective mounting depth of 45mm or less, or you can space the speaker off the bracket



Figure 4

using some small washers or plastic spacers. These are easy to find at the hardware store, or even make up in your basement, so this really isn’t an issue. Either way, you will probably need to buy 4” coaxial speakers with a mounting depth of 60mm or less (~2 5/16” max) to avoid contacting that bracket I talked about earlier.

Do yourself a favor and solder the connections! Don’t use crimp connections if you can avoid it, but if you do have to use them, make sure you heat shrink or electrical

tape them completely. You don’t want some intermittent problem with your front speakers cutting out because an exposed wire or connector is contacting a bracket somewhere.

If you are using the modified stock bracket, and you followed the instructions, you can use the stock connectors for your new speaker. If you opted for a different approach, you will need to splice the wires in or replace the connectors as I did. Radio Shack sells a nice M/F keyed connector set that I used (see figure 5) for a few bucks. It is part number 274-222. You will need 2 of these for the fronts, 4 if you plan on doing the doors also.

Figure 5



On the speaker feed wire, you simply cut off the old stock connector, strip away 3/8” of the insulation, solder and/or crimp the wires onto the ends of the pins, and insert the pins into the male connector.

On the speaker side, solder or connect a short piece of 18 gage speaker wire to the terminals on the speaker, strip away 3/8” of the insulation on the other end of the wire, solder and/or crimp the wires onto the ends of the pins, and insert the pins into the female connector. Make sure you observe polarity when you do this. The finished setup looks something like figure 6 and 7.

Figure 6

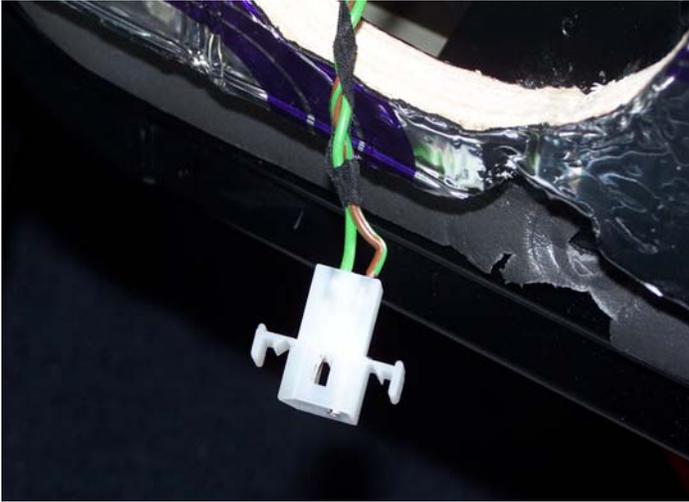


Figure 7



Plug everything in and remount the speakers in the dash. If you've been a good boy or girl, and kept the mount depth below 60mm they should drop right in and look stock as can be.

OK, now you have the front and back speakers improved. All that is left to do is the doors. Unfortunately, this is probably where all the hard work is going to come in, at least assuming you are going to make the move to 6 1/2" speakers here. Believe me, it IS worth the effort, and it really isn't that hard, it just takes some time and patience. In the end it will pay off with vastly improved bass response while still maintaining a totally stock look.

If you are going to stay with 5 1/4" speakers, make sure that the speakers you buy have a mounted depth of 3" or less. Any deeper than that and they aren't going to fit in the stock enclosure without modification.

Whichever way you decide to go, the first step is going to be to remove the door panel. I found a great set of instructions for removing the door panels on ecoutez.com done by a J. Reiser. These are very complete and thorough instructions, so I have borrowed some of their pictures for this article, and added some of my own illustrations and text to improve them a bit. **A bit of advice though: grab a beer, sit in your favorite chair, and read through these instructions completely before you actually start anything.**

1) Disconnect the battery ground (figure8). This is a particularly important precaution for vehicles with side airbags. If you have an older (2002 or earlier) Boxster, **make sure you have your radio code first!**

Figure 8



Figure 9



Figure 10

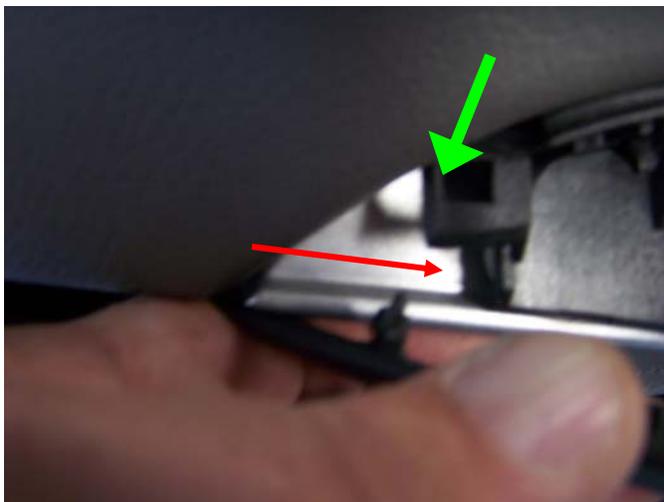


2) Remove the plastic cover shown in Figure 9 which surrounds the door pull. This is probably the most difficult piece to remove as it requires some force and quite a bit of finesse. Looking from underneath the cover, you'll see a small indentation near the center as shown in Figure 10. You can work a flathead screwdriver into this spot and begin prying the cover up from the bottom as shown in Figure 11.

Figure 11



Figure 12



Do so GENTLY, and keep a finger or two over the pointed front area as shown in Figure 11. There is a small plastic hook behind this point of the cover that fits into a hole on the door and can easily be broken. This is shown in Figure 12. Once you have the large portion of the panel loose, this small hook will be all that is holding the cover in place. Use a small flathead screwdriver to gently press down on the hook's latch end to release it (the area shown by the thick arrow in Figure 12.)

3) Using a #30 Torx driver, remove the torx screw behind the plastic cover you just removed (and shown in figure 13) . This is a long screw that holds the door pull in place and should be pretty tight.

Figure 13



4) Next, you must remove the trim ring on the door pull to get at the next Torx screw, which is behind this trim ring. Use a small, thin blade, flathead screwdriver to lift the bottom edge away as shown in Figure 14, then grasp the ring with your thumb and index finger as shown in Figure 15. Rotate the ring upward to roll it free and remove it.

Take note: if you look at the inside edge of this clip, it will be marked to indicate which door (R or L) it is to be used on, and which end is the top. Useful later if you are unsure when reassembling ☺

Figure 14



Figure 15



This will then expose the second Torx screw to be removed. With the same Torx driver you used for step 3, remove the second Torx screw from the door pull (behind the clip you just removed.) It's even longer than the first, and should be just as tight. Note that there is a plastic piece behind this area of the door pull which is removable. There is no need to remove it. **Also, DO NOT ATTEMPT TO USE THE DOOR PULL FOR ANYTHING ONCE IT IS UNBOLTED!!! YOU CAN EASILY DAMAGE IT!**

Figure 16



5) Next you need to remove the Phillips head screw from behind the door handle. You'll need to hold the door handle open while you remove it as shown in Figure 16. Be careful not to scratch it with your screwdriver.

6) The next screw to be removed is a Phillips head screw located inside the storage cubby below the door pull as shown in Figure 17 below. The screw is only plastic,

and sometimes these can be a little tricky. You need to make sure you use the correct size screwdriver (a #2) and use light pressure while removing the screw. Also make sure that the tip of the screwdriver isn't worn excessively or damaged. As long as you have the correct size screwdriver, with a tip in good condition, and use light pressure on the screw, it should come right out.

Figure 17



7) Next, you will need to remove the plastic piece labeled "AIRBAG" which covers a short Torx screw. There are a couple of ways to accomplish this: 1) by using a flathead screwdriver with a cloth covering it to protect the door panel (as shown in Figure 18), or by using something like 20 lb. fish line slid under one corner of the plug, then wrap the fish line around a bar (like a hammer handle) and the plugs can be pulled off. Your call. I did the screwdriver thing, and I had no problem – you just need to be careful.

Figure 18



Figure 19



Figure 20



Once you have the plug removed, use your Torx driver again, to remove the screw from inside the airbag opening. Note that this is a very short screw and you will want to be careful not to drop it behind the airbag. I'm not sure how easily it would be retrieved in that event, so be careful. Like the door pull screws, this one will also be very tight.

8) Next you have to remove the sail panel (triangle-shaped plastic at the front corner of the door.) Take a look at the series of photos so you'll see exactly how it's attached. Use a thin flathead screwdriver, shielded by a towel or wash rag to pry out and up on the bottom edge of the panel as shown in Figure 21. As you pry the bottom of the panel away from the door, three pins will pop out of their sockets. Once they pop out, you can stop prying. The sail panel has a hook that hangs in an opening on the door as shown in Figure 22. Once the three pins are free, just slide the sail panel straight up to finish removing it. You might need to wiggle it a little, but this should come free easily without damage.

Figure 21



Figure 22



Once removed, the panel can just be left hanging there. There is no need to disassemble it further.

9) Finally, use a panel removal tool (or flathead screwdriver and fingers) to pop out the clips on the front, bottom and rear of the panel as shown in Figure 23. These are standard door clips - about nine of them. Once the clips are free, lift the door panel up and out of its seating track. **REMEMBER - DO NOT USE THE DOOR PULL TO LIFT THE PANEL!!!!** It is unattached at this point and can easily be damaged. Use the door panel edges to lift it out.

Figure 23



10) There are three cables between the door and panel that you will need to deal with (Figure 24 shows 2 of the 3). The lower connection is for the door entry light and simply pulls out of the door panel. The last is the power to the door handle. On my '03 this connector had to be slid back and then lifted upward. With the one power cable removed, the door panel can easily be leaned against the door.

Figure 24



The door handle cable has an “s” shaped end that is simply worked (wiggled) out of the bracket and grommet.

If you're just planning to replace the 5 ¼” speakers with new ones, there shouldn't be any need to remove the door handle cable.

If you are installing 6 ½” speakers go ahead and remove it – you will need to have the door panel completely unattached.

11) With the door panel out of the way, you can see the stock speaker enclosure shown in Figures 25 and 26. The speaker itself is held on by 4 phillips head screws as shown in Figure 25. The enclosure itself is a molded plastic tuned port enclosure held in place by six phillips head screws. Some of those screws are visible and some are under the grey moisture barrier.

If you are simply replacing the 5 ¼” speakers with new 5 ¼” drivers, you will need only to remove the 4 screws holding the speaker/grate in place (shown in Figure 25); remove the stock speaker, reattach the speaker leads onto your new speakers and reattach the speaker/grate combination into the enclosure. I would reattach the battery and test the speaker at this point before reassembling everything. Make sure you disconnect the

battery again before reinstalling the door panel. Reattach all the cables and connections to the door panel (Figure 24) and follow these instructions in reverse order to reinstall the door panel. Repeat the whole process with the other door. Enjoy your new speakers.

Figure 25



Figure 26



If you are going with 6 1/2" drivers, we have a little more work to do. For this we need to remove the tuned port enclosure and replace it with a custom made baffle plate as shown in Figure 27, which we will cover in sound deadening material and attach to the inner door skin in place of the plastic enclosure. The baffle is probably easiest to make out of wood, but it could also be made of any of a number of materials such as Lexan; Delrin; ABS plastic; or even aluminum. Whatever you choose to use, it will need to be about 5/8" (0.625") thick. I used 3/4" Oak ply for mine (because I had some lying around), but 5/8" would have been a little better and easier.

Figure 27



12) Before we can start to fit this baffle, we will need to remove the stock enclosure. Some of the screws for this can be accessed easily, and some are behind the silver membrane material covering the inner door skin. The membrane material is held in place by a bead of adhesive around the outer edge. There are 2 ways to deal with this to get the enclosure out. Option 1 is to pull back the membrane a little at a time by hand cutting the adhesive bead as you go if needed. I didn't like this method because I found that it tends to stretch the membrane out of shape, so I went with option 2. The second option is to cut the membrane using a hobby or sheetrock knife (razor blade) closely around the enclosure edge (shown in Figure 28 after the enclosure was removed). This leaves the bottom, front, and rear edges of the skin untouched and only cuts away enough membrane for the baffle plate. This creates a nice, sealed, fit for the baffle plate.

Figure 28



Once this is done, remove the six Phillips head screws holding the enclosure in and remove the enclosure.

NOTE: the window must be rolled at least ½ way up for the enclosure to clear when being removed. If necessary, reconnect the battery and roll the window up, then disconnect the battery again.

13) Next you will need to make a template out of cardboard. This can be done by laying the stock enclosure face down on the cardboard and tracing the outline –OR– by printing out my *door speaker baffle template* and tracing it onto a piece of heavy cardboard, then cut a template out of the tracing. You may need to “tweak” this template a couple of times so have some extra cardboard and a fine point marker or pencil around.....

We only need to make the template reflect the outer face of the stock enclosure, that is to say, the portion shown in Figure 29. With the enclosure face down on the cardboard (the face shown in Figure 29) as shown in Figure 30, trace the portion of the enclosure indicated by the dotted green line. The section between the two arrows that cuts straight across the portion of the enclosure that was inside the door can just be drawn in as a straight line after you have traced the rest. Be sure to trace or mark out the position of the front two mounting holes on the template also.

Figure 29

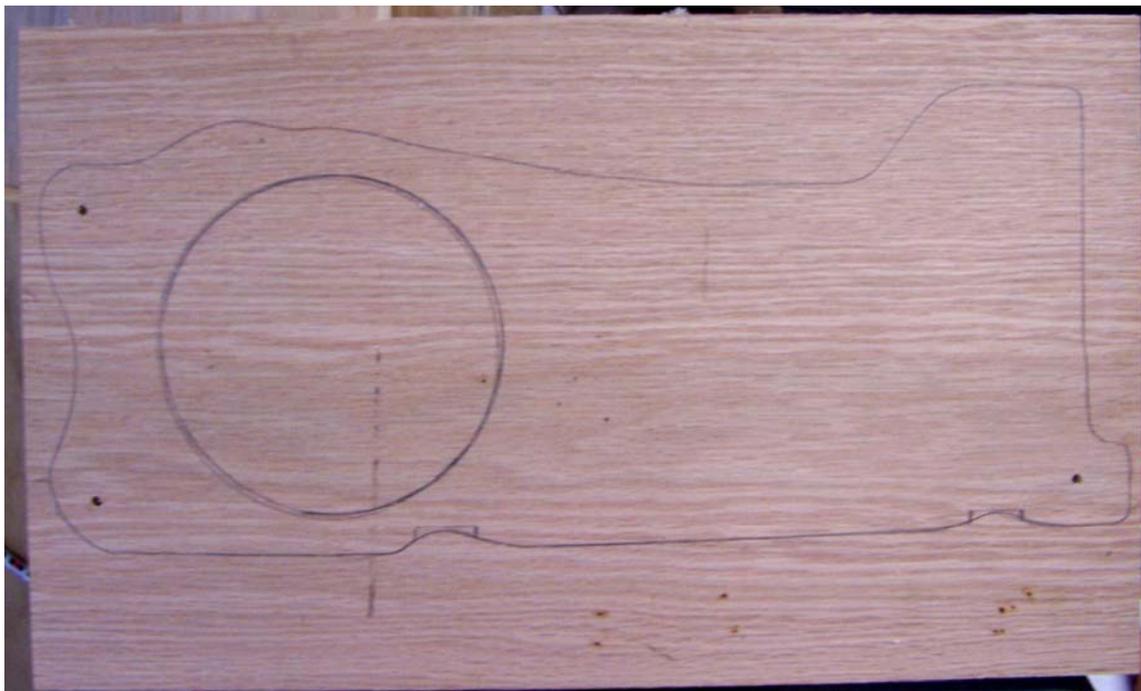


Figure 30



The drawn template should look something like figure 31. The speaker hole cutout size will be determined by your chosen speaker specifications. Make sure that the hole will clear all metal on the inside door skin.

Figure 31



14) Cut out the cardboard template and use it to trace a second one. Don't cut the second one out yet.

15) Now we will test fit the cut out template to the door. Use the front two mounting points that you traced off of the stock enclosure as your reference points and fit the template onto the door. Note where changes need to be made to the template , and how much material needs to be added or removed. Make the needed changes to the second template that you traced, but didn't cut out yet.

Figure 32



this to trace another working template that you don't cut out yet. Fit the modified template to the door and check for fit once again. If more changes are needed, make them to the uncut working template and repeat the cycle until you have a template that is a "perfect" fit. It should fit like the wood one shown in Figure 32. Note how I have added a "fin" to the top rear of the template to bring it right up under the flat mounting protrusion. This makes for an easier mount surface and a better rear reference point. **Pay special attention that the bottom edge of the baffle will clear the ledge on the inside of the door panel.**

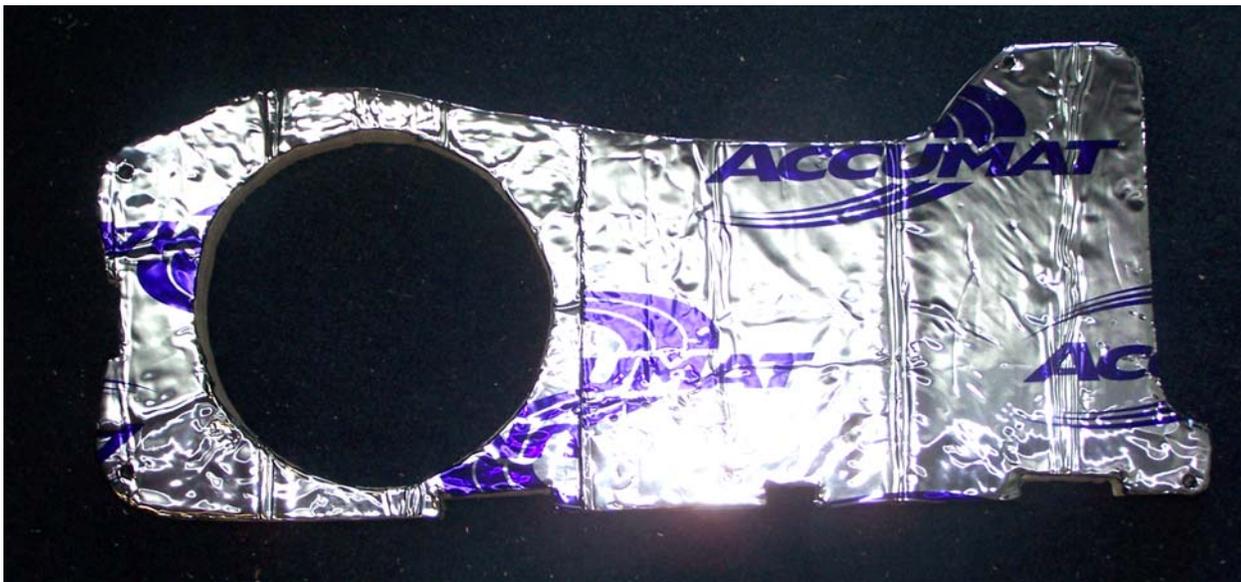
16) Once you have an excellent fit against the door with the template, it is time to transfer the design to the real deal...the actual baffle material. Trace the final template onto the baffle material you selected and cut it out. Sand or file the edges smooth and test fit it again. Once you are sure it fits well, you can trace it and cut out another for the other door. This was my finished mounting baffle made out of 3/4" oak plywood. As I mentioned earlier 5/8" would have been fine, and actually would be a bit easier to work with, so you don't really need a 3/4" baffle. Note that I left quite a bit of headroom in the notches along the bottom where the door panel clips will pass the panel.

Figure 33



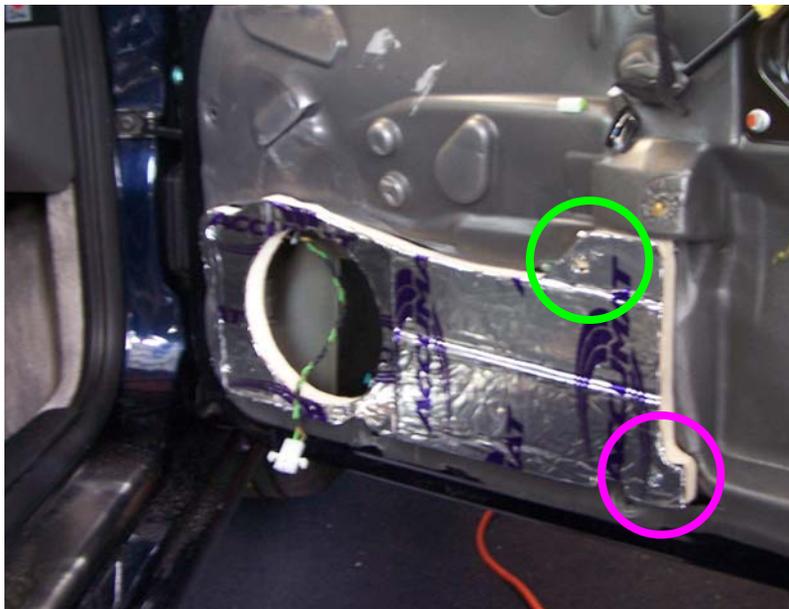
17) You don't have to do this next step, but it will yield better acoustics if you do. I purchased Scosche Accumat sound deadening material (available from Walmart) to cover both the front and back of the wood baffle. Other sound deadening materials will work as well, Dynamat for example which can be bought through www.wooferset.com or other car audio stores. The finished mounting baffle looks like this:

Figure 34



18) Time to mount the new panel. The front mounts to the two screw holes that were used for the stock enclosure's front tabs. The upper rear of the baffle, I mounted by screwing through the panel at about a 45 degree angle and catching the rounded edge of the inner door skin in that area (shown in the upper circle in Figure 35). You will want to drill a larger countersink hole about 1/4" deep to sink the screw head below the panel surface. To secure the lower rear of the panel, I screwed the panel into the edge of the inner door skin at a slight downward angle. This is shown in the lower circle in figure 35.

Figure 35



19) Now you need to re-route the speaker wires. The stock wires exit near the top of the door and were routed down over the outside of the membrane as shown by the line in Figure 36. These need to be routed down through the inside of the door and out through the hole in the baffle. Behind the membrane, in the area shown by the circle, there is an opening in the inner door skin. Route the speaker wires behind the membrane and down through this opening into the bottom of the door and out the opening in the baffle.

Figure 36



20) Near the front baffle mount points you will find part of the factory door wiring harness. Zip tie the re-routed speaker wires to this as shown in Figure 37. This will assure the wires stay out of the way of the window or other internal mechanisms.

Figure 37



21) Time to set up the connections to the new speaker. Cut the stock connector off just behind the connector as shown in Figure 38. Now you have some options. You can solder or crimp some female spade connectors on for connection to the new speaker, you can solder them fast, or attach a new connector as I did shown in Figure 39. Again I used the same Radio Shack M/F keyed connector set that I used for the dash speakers. It is part number 274-222. The female connector is installed on the factory leads, and the male to the new speaker. The speaker side connection is soldered or crimped to a short speaker wire lead that I soldered to the speaker terminals. The whole setup is shown in Figure 39 and 40. **DON'T FORGET TO OBSERVE POLARITY.** I put the positive lead (solid green) to the pointed end of the connectors and the negative to the flat side,

Figure 38

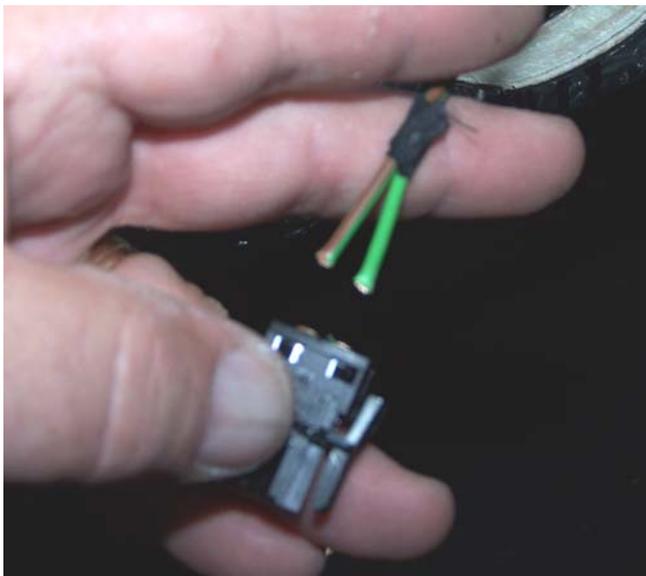


Figure 39

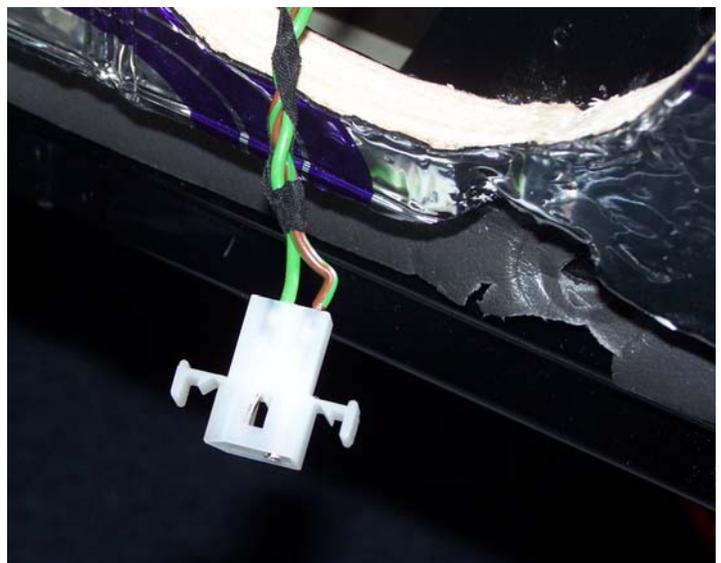


Figure 40



I like this method because it is functionally solid, cheap to do, and easy to interface if I decide to try another set of speakers in the doors later. Spade terminals tend to vibrate and move, as well as oxidize more than these connectors. These connectors are much more reliable over time.

22) Connect the speaker and mount it in the baffle plate. Screw or bolt it in place in at least 4 places around the circumference. The finished job should look something like Figure 41.

Figure 41



23) All that's left to do is reattach all the cables and connections to the door panel (Figure 42) and follow these instructions in reverse order to reinstall the door panel. Repeat the whole process with the other door.

Figure 42



ONE ADDITIONAL operation that you may have to perform, or may not, is a minor modification to the inside of the door panel. When I did my car, I used a 3/4" material to make the baffle out of.. When I remounted the door panel it fit back together, but was a very tight fit against the baffle along the front bottom edge of the panel. I decided to take the door panel back off and make some minor modifications for better clearance.

The front inside of the door panel has molded gussets that are WAY longer than they need to be to serve the intended purpose so modifying these a small amount isn't a big deal. Using a dremmel tool I removed about 1/2" of the gusset material to allow for better clearance. The pictures below show the modification I made.





With this small modification to the inside of the door panel, the panel went back on and fit beautifully. The finished job is shown in the picture below. It looks exactly as it did before I took the door panel off. I have had no problems with rattling, door panel popping, or operation of the doors or windows.

The bass presence is significantly improved with this modification, so dive in and have some fun. After all, doing things little like this is half the fun of owning the car! I hope these instructions help out many a new Porsche Boxster owner to come !

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