

993 Stealth speaker update - 2016

Objective – Update the front and rear speakers on my non-hifi 993 to achieve a noticeable improvement in sound quality, without any modifications to wires, fittings, covers, etc. Must be entirely reversible and preserve original parts - oh and don't break the bank in the process.

Background – I'd looked at a number of upgrade recommendations, most notably those from the PCGB forum, 911uk and rennlist who mostly suggested an upgrade route using JBL GTO508C at the front and JBL GTO6428 at the rear (the latter are now a revised model, but more on that later). While these achieved a “mostly” drop in upgrade, I could see there was some modification to fittings, adaptation of wires and a socking great JBL cross-over unit to hide in the door pocket. I wanted to avoid all of this if at all possible.

Eventually I then came across this post which helped a lot:

<http://www.911uk.com/viewtopic.php?p=691418> (scroll down to find the entry by Trap 125)

This owner describes an approach of cannibalising the original Porsche front mid-range speakers to remove the plastic surround from the speaker and attaching these to the upgrade speakers, so that once complete, the original grills can be refitted to hide the modifications. He also describes the approach of replacing the small tweeter with the unit from the GTO508C kit by using the original Porsche housing. Finally he modifies the base plates in the rear and manages to fit the GTO6428's beneath the original grills. All good and I think this is a great job. For my own car, I've taken this approach and modded it slightly on the basis of the following:

1. I've purchased a full set of Porsche OEM front speakers and rear base plates and cannibalised these, rather than my cars original parts. This has allowed me to retain all of the original parts, in case I ever want to restore to total originality. Cost isn't high and I also came to this approach because I first tried just replacing the speakers with stock new ones, to see if age had made them deteriorate, (it made very little difference).
2. I fitted the Audison AP1 tweeter and the associate micro-crossover, rather than the JBL tweeter because the AP1 is a higher quality unit and the cross over is tiny and easily fits under the front woofer, rather than having to modify the door panel to house the large JBL crossover.
3. I used a set of Kicker 40cs464 at the rear because the updated JBL units now have a deep plastic surround rather than a metal one and so will not fit below the original grills. The Kickers are much more like the original 6428 dimensions and easily fit once the base plates are buffed out a bit. They also do not protrude beyond the mounting level, which is a requirement to be able to refit the original grills.
4. I identified the equivalent VW connectors which match the original Porsche Nokia speaker connectors and with further cannibalisation of the replacement OEM speakers, this has allowed me to achieve a plug in upgrade without any modifications to the original wiring in the vehicle.
5. My car came with an ugly Sony header unit, which was probably period, but I have replaced with a period Becker Cascade which looks very in-keeping and offers some notable advantages which I've summarised at the end of this installation. I picked this up on eBay, but it sure wasn't cheap.

Overall the audio results are a substantial improvement; there are zero visible modifications and all changes would simply unscrew, unplug and the original parts refitted if required. Full description below, hope it's some use to someone.

Parts list:

2 x Porsche tweeters (these are supplied from OPC with replacement wires which run between the tweeter and the woofer – we need these to modify the cross-over, so make sure you get them).

Tweeters are [993 645 502 00](#)

2 x Porsche Woofer/midrange, [99364550500](#)

2 x Porsche Rear Speaker base plates, aka space frames ([993.555.769.00](#)) (these were on back order, so took a while to obtain from OPC) but were only £2.21 each

JBL GTO508C (set of front speakers)

Audisson AP1 Tweeter set (make sure it's the set with micro-crossovers)

Kicker rear set 40cs464

4x VW SpeakerConnector: 1HO-906-712

4 x VW Repair Wire: 000-979-129

Gap filling glue – I used Araldite

Black Tack (Amazon photography black tack or search for Black Magic Tack)

Heat Shrink (sized to fit speaker wires)

Tools:

General hand tools

Plastic pry tools to remove the speaker grill without breaking them

Dremmel or similar hand cutting/grinding tool.

Soldering iron

Method:

Starting on the front mid-range, take your replacement Porsche units and carefully cut off the plastic surround and proceed to clean it up. (The first couple of pictures below are from Trap 125's posting – I didn't remember to photograph mine at this point)

Free the plastic ring – I used a Dremmel here: (picture from Trap 125)



and you get this – which you should clean up and keep trying fit against the JBL unit:



Trap 125 took the approach of fitting this ring on the outside of the speaker, as you can see below:



I tried this initially, but as you can see in the previous photo, with this approach, the face of the

speaker protrudes and I found that I could not fit the original grills. For this reason, I fitted the plastic speaker surround to the outside of the woofer and I made a very thin plastic ring to fit behind the speaker, just to give a little re-enforcement and to keep the metal speaker brackets from being in direct contact with the door card. I made these plastic rings using the base of two black plastic plant pots – you just need a source of thin blast plastic.

Here the speaker is positioned with the plant pot ring behind to protect the door card and the ring cut from the original speakers is going to “sandwich” the speaker on the outside using the standard attachment screws.



And here it's all screwed together, the standard grills can be clipped back on as normal and the movement of the speaker is not impeded because it is slightly recessed from this grill.



Once you have the mounting sorted for both sides, you need to go back to the Porsche OEM speakers and cut-off the dual speaker connection (it also feeds the front tweeter). Your going to attach this to your JBL upgrade speaker so that you can use the original cabling to connect it up. You want to cut-off the speaker connection in such a way that you can proceed to glue it to the new speaker as shown below:



from another angle:



now solder the connections from the terminals on the connector to the speaker terminals. Luckily they are on the correct sides, and if you have retained enough of the connecting wires, you will save yourself a little bit of soldering. Once connected, it will look like this:



Having done this, you now have an upgraded speaker which will connect both to the original input

and the connection for the tweeter. You now need to modify the connections on the AP1 cross-over unit, by:

- ⑩ soldering on the plug end of the cable which came with the new Porsche tweeter, to the input of the crossover
- ⑩ soldering on one of the VW sockets to the “tweeter” connection on the cross-over

The Porsche tweeter cable you are using looks like this:



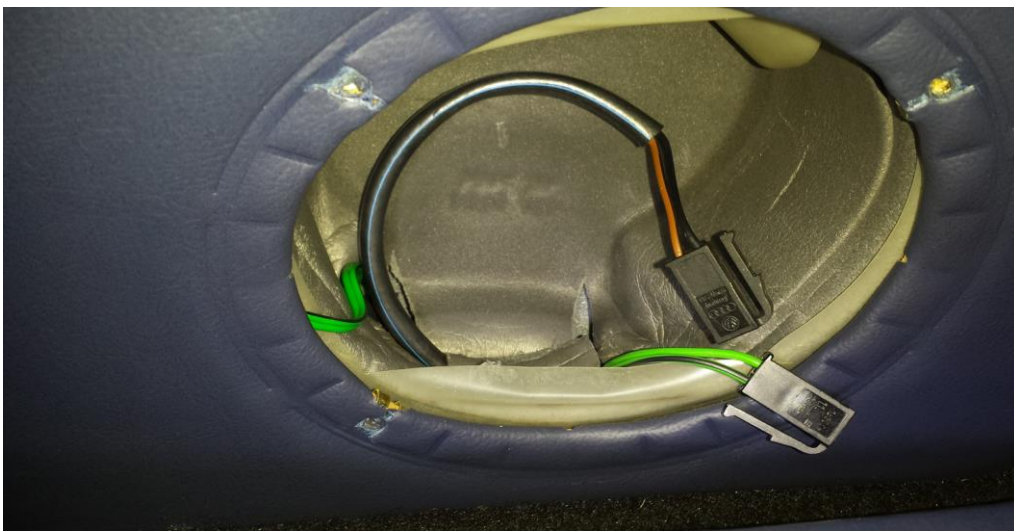
You need to produce this – remember to cover your soldering using some heat shrink:



Once you've done this, your going to fit this into the bottom of the door space, so it sits below the woofer. The units come with a cable tie, so you can secure it to one of the cables in there to avoid rattle: (before you tighten it up, note that the cross-over has two levels - I would suggest setting the lower dB value, ie. Making the tweeter relatively louder)



once installed, you can't see the cross over and all you have is the two connections for the woofer and the tweeter:



You can now install the woofer, using your plastic rings, clip your original grills back on and that bits all done.

Turning to the tweeter, you need to pry out the contents from the OEM tweeter and use a Dremmel to remove the internal plastic re-enforcements so that the AP1 will fit in there. Keep taking small amounts away until it fits snug – there must be no protrusion outside tweeter casing because otherwise you will find it won't fit back on to the door mount.

Here's what you start with:



now remove the contents and Dremmel out the re-enforcements:



and from another angle:



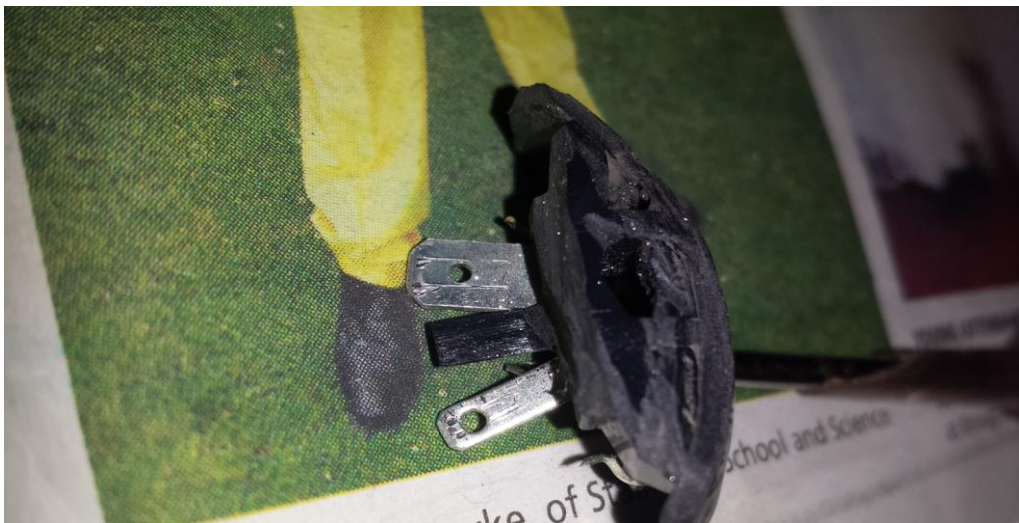
here's the size of the AP1 compared to the original Nokia unit:



Now take the OEM tweeter unit and cut-off the connection section. Do this carefully so that you don't damage the connections and retain a small amount of plastic surround to be able to glue this back into the tweeter housing:



Now trim this down to: (ignore the yellow pants in background, that's not important)



Once you have this, line the tweeter housing with a small amount of black tack which will act as a means of securing the tweet and also prevents rattle, make sure there is no protrusion above the line

of the housing and then proceed to glue the connection to the housing rim:



Now solder up the connections (note the orientation below) and you have in your hand, something that looks like the original Porsche tweeter, but sounds miles better:



Fit it as the original unit, using the original cabling and your done in the front.

The rears are a more straightforward job. The Kickers are shown here next to the originals – before fitting the Kickers, I painted over the yellow logo with matt black paint:



The original connections on the speakers are shown below:



We're just dealing with a single connection here (unlike the front units), so we just need to solder on the VW connections which are the same as the Nokia's to the new Kickers: (cover the delicate parts of the speaker while soldering, because hot solder will go right through very easily)

Notice that the Kickers don't protrude at all, so there's no problem refitting the original covers:



Now the only remaining job is to take the new base plates and buff them out using a Dremmel or something similar. There's quite a bit of material to remove and you need to keep trial fitting until the Kickers fit into the base plates snugly, without warping the base plates. The plates will be quite thin down the sides by the time you have finished, so take it slowly. To make things easier, I made paper templates and because the frames were on back order, I created temporary "support plates" from thick cardboard which I used for a few months while waiting for the real plates to arrive.

Now put it all together and refit the covers. Job done, enjoy the results.

Header unit

Some of your results will depend upon your header unit of course. My car came with an ugly Sony header unit, which was probably period, but I replaced this with a period Becker Cascade which I paid through the nose for on eBay. I know some folks will insist on keeping the original Porsche header if it's present – but of course, this wasn't fitted to all cars originally. I'm sort of glad I didn't have this dilemma because to me the Cascade looks very in-keeping, notably the plastic colour and the buttons match the nearby light controls, (something you can't say about the OEM unit). I know some people like the Becker Grand Prix which has smaller buttons matching the air-con controls. Anyway, I really like that the colour of the Cascade lighting can be adjusted to match the instruments which looks great at night.

Aesthetics aside, most importantly for the sonics, the Cascade has several adjustments which can be used to work around cabin acoustics, including full fader control, virtual surround and full frequency response adjustments including a graphic equaliser and separate cross over adjustments for front and rear speakers. This latter is quite important because you're still limited by the overall size of the speakers on base response, so this cross-over allows you to tune out overloading on front and rear units separately.

Not the best picture, but here's one showing the Cascade in my midnight blue/black interior.



The Cascade also has old school satnav which is updatable to current maps and Bluetooth phone integration, although this doesn't include Bluetooth audio streaming (a2dp not supported). I have also successfully used an 8Gb memory card and can carry on this a good, mp3 music collection (LAME encoding is best for this unit) as well as running a std. audio jack into the ash tray to allow direct playback from phone/ipad.

I've got some instructions on techniques and software to use when updating the firmware and maps on the Cascade so I might post these separately because this is a long enough guide.

Hope all this is some help as a collation of techniques.