

Upgrade your 86 audio for \$50!

I have previously voiced my opinion on the inferior sound the system delivers, especially from those pointless rear speakers. I have never been one to buy an expensive after market stereo and fit powerful amps and a sub woofer and it is not needed here. As an electronics technician involved with servicing, design and manufacturing, the following is purely my approach to improving the sound without spending a fortune.

The head unit and amp in the 86 is certainly not top of the line by a long shot, but it is not rubbish either. It is actually of an acceptable grade. It is mainly let down by the speakers. Under the dash, you have a couple of 2" tweeters. In the front doors you have 6.5" full range speakers. This is the only place in the car where any acceptable sound is emitted. The rear speakers are 3.5" cone speakers, but they have been configured as tweeters. Each has a non polarised 3.3uF capacitor in series with them. So you have 6 speakers, 4 of which are effectively tweeters!!!

Capacitors are unable to pass low frequency AC effectively, (audio is AC) so that is why they are very quiet and cannot produce any bass. Only the high frequency treble is passed to the speaker. However due to the limited cone movement in the 3.5" speakers, they would not be able to handle much bass anyway. You could just remove the capacitor connected to each speaker, but considering the trouble you have to go to by removing the back seat cushions and the side panels to get to them, you wouldn't bother just doing that, because the gain would not be worth the effort. So you might as well replace them with something better. Hence the reason I have documented this, to show what can be done.

So, before you go out and purchase that \$2,000 audio system and then pay some bloke to fit it, at least have a proper read through this document and see what I did for 50 bucks.

I don't regret it one bit.

All I have done so far is purchase a couple of Pioneer 4" dual cone speakers. They cost me \$49.00 in total.

Model# TS-G1014R.

4" Dual cone. (180W Max) 30W Nom 4 Ohm 45Hz - 26kHz

They come as a pair with grills, screws and clips. There is even a hole template on the box, but the way I have done it, they weren't required. I did not go for the 2 way type as there is enough treble in the system as it is and it is just a bit more bass and rear volume that is needed.

I have included many pictures to help explain what I've done.

Procedure

1. First of all pull up the front door scuff plate.
2. Go into the boot and remove the 2 plastic rivets that join the rear luggage trim to the internal rear passenger trim.
3. Remove the bolt holding the rear seat cushion and remove the seat.
4. Locate the plastic rivet located at the bottom of the rear passenger trim and remove it. (This is visible once the seat cushion is removed)
5. Peel back the rubber door seal just enough to expose the edge of the rear trim and start to pull the trim off gently. The trim is only secured by 8 white plastic push rivets that push into holes in the body. Try popping them out of the body one by one by pulling the trim inwards. Using a long screwdriver can help lever them out if they are stubborn.

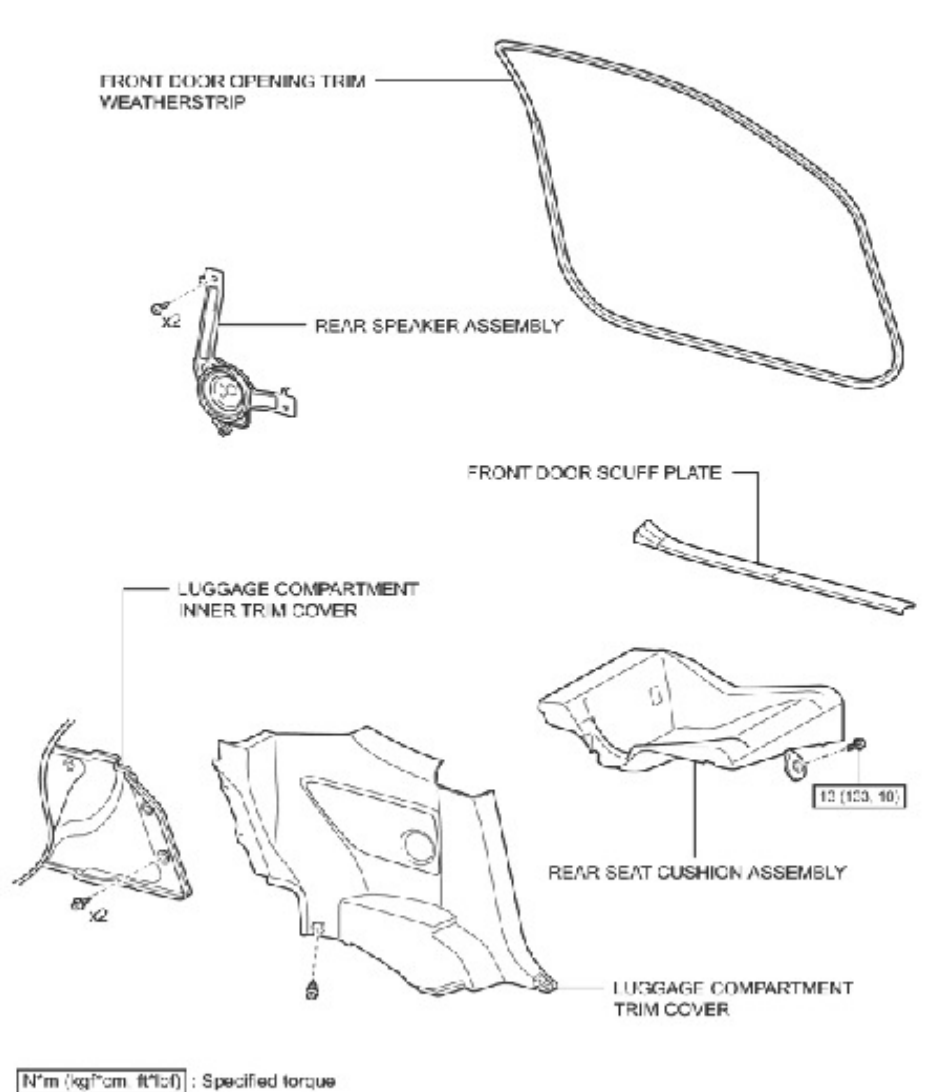
Once the trim is removed, the speaker and supporting bracket will be exposed.

The picture below shows all the points mentioned above.

Last Modified: 8-1-2012	6.4 K	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000004MZ8007X
Title: AUDIO / VIDEO: QUARTER TRIM SPEAKER: COMPONENTS (2013 FR-S)		

COMPONENTS

ILLUSTRATION

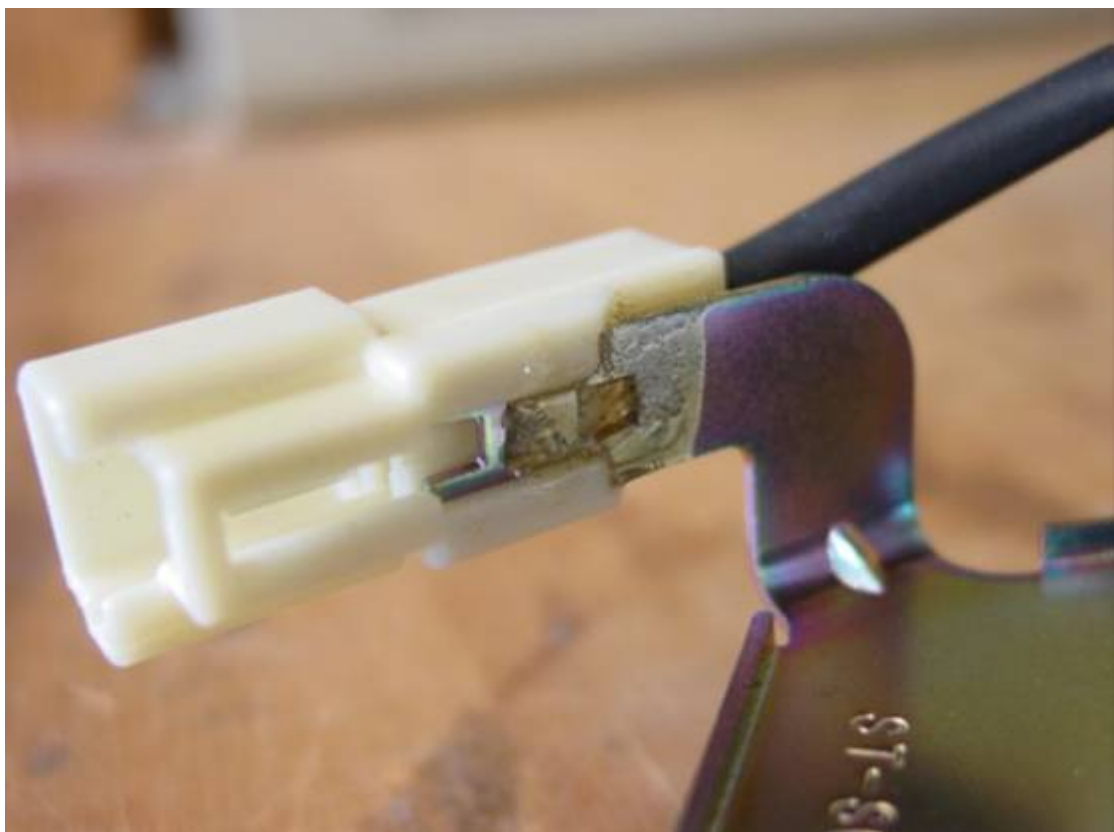




Unplug the speaker connector and unscrew the bracket to remove the speaker and bracket complete.



The replacement 4" speaker is not that much bigger than the original, but you can't use the old bracket. Not that it matters, but we need to reuse the connector.



This connector needs to be unsoldered from the old speaker FIRST. Then scrape as much glue off the bracket as you can and pull off the connector. Solder this to the new speaker terminals. Ensure you solder the white wire to the positive terminal.



Here's a picture of the capacitor on the old speaker, which is the main cause of the low volume and "tinny" sound. If the black wire was moved to the blue lead, it would be bypassed and the sound quality will improve and so will the volume. You may want to just move that ONE wire so that it connects directly to the voice coil.

Try it first and if the improvement is enough for you, then you do not need to proceed any further. Replace the trim and do the same to the other side.

However, if it is not to your satisfaction proceed with the rest of the upgrade and it will require cutting your trim.

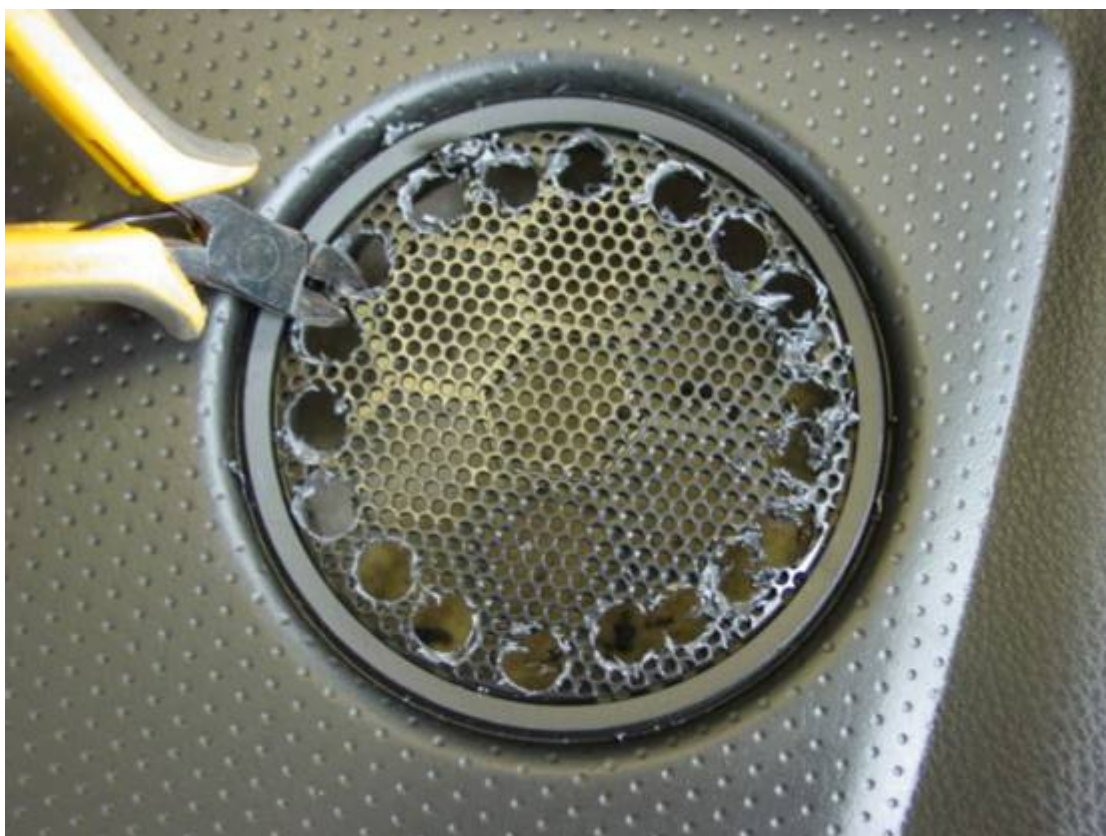
Notice also that the speaker is of 6 ohms impedance and a MAX rating of 35Watt. The new speaker has a MAX (peak) power of 180W and a nominal (continuous) rating of 30W and an impedance of 4 ohms.



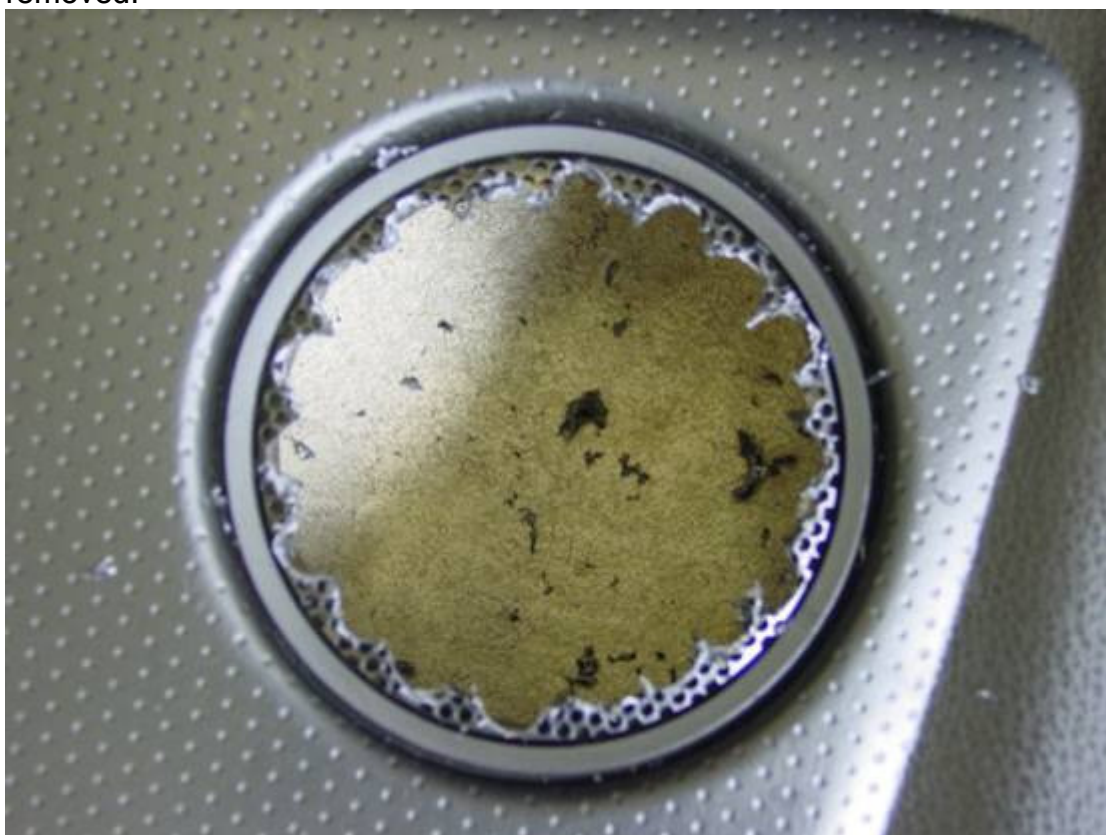
The intention is to cut out the original grill. The speakers I have chosen fit perfectly in the hole made.



Using a 7 or 8mm drill bit, drill a circle of holes around the circumference of the grill.



Now cut the bits in between the holes with a pair of nippers. until the grill is removed.





With a sharp knife, run around the outer ring to score a deep line so that it will be easier to remove. Note: You don't need to cut right through, just a deep score is fine.



Cut through the outer ring with nippers to get things started.



Pull the ring inwards with pliers until you have separated it from the edge by about an inch.



Now continue around pulling the ring inwards and using the knife to leave a clean cut. Trim any stray bits once the ring is removed.

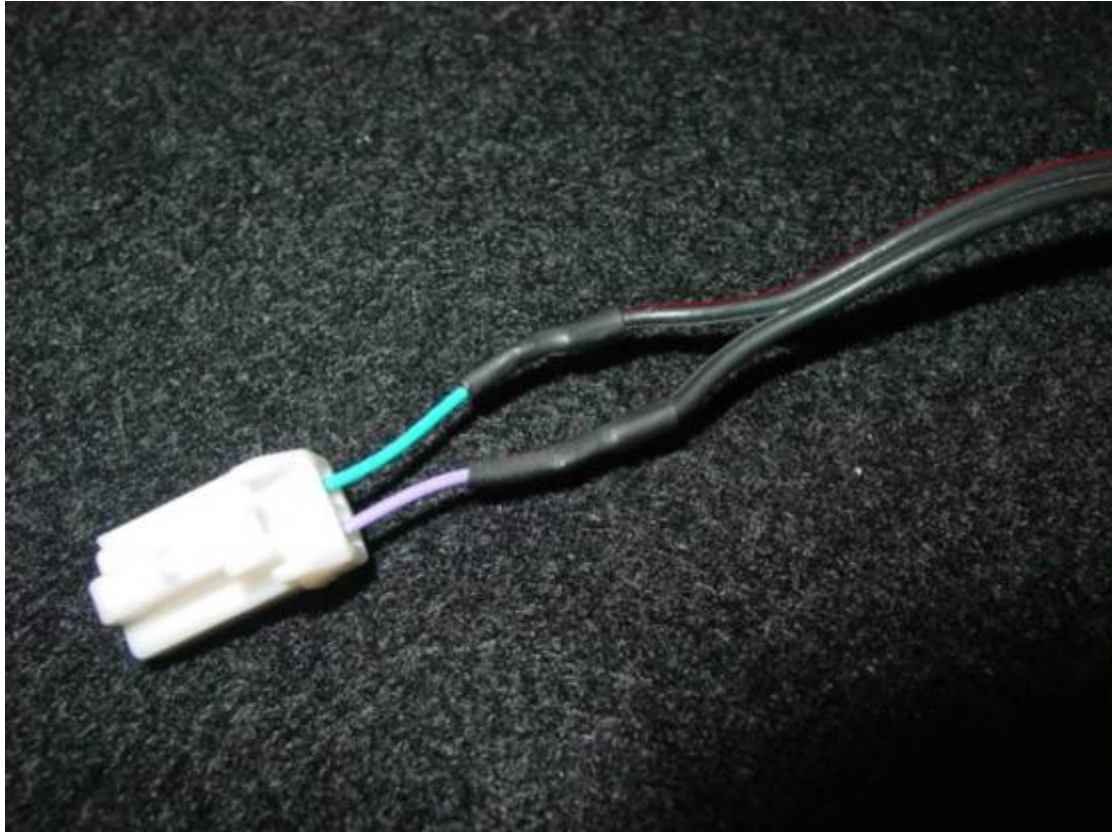


It should look something like this and you end up with a perfect circle without even trying!



Next you need to fit the metal clips that will hold the speaker and screws in place. You need to cut into the plastic with a knife so that they line up with the speaker holes. You can see this more clearly if you look at the lower left clip in

the picture. Once in place, drill some small pilot holes (1mm). This is soft ABS plastic so the self tapping screws will cut their own hole. Don't think the speaker is just being held in place by plastic, because it isn't. The clips are "U" shaped and the hole you can't see is underneath and this is what the screw bites into. You can squeeze them closed a little bit so they stay in place.



Since the new speaker is now going to be part of the trim rather than fixed to the body, I decided to lengthen the wire by 300mm. Some light duty speaker cable was added after cutting the plug off leaving about 30mm of wiring sticking out. Each end was soldered and sleeved with 3mm heat shrink.

The reason for this is so you can remove the speaker without removing the panel trim. The extra wire length makes it much easier to detach and reattach without having to fish around behind the panel.

Note: Left-hand speaker colours;	Blue is + and purple is -
Right-hand speaker colours;	Pink is + and yellow is -



Before fitting the speaker, refit the panel trim. Take your time as those white plastic rivets in the trim have a tendency to fall out and then you have to fish them out of the bodywork. Get the panel roughly in place and tap the panel to engage each rivet one by one. Since there is no speaker fitted yet, the hole can be useful for getting your hand in there and getting the clips in place. Once the trim is in place, check the seat belts move freely and refit the door scuff plate.

Reach in and grab the speaker connector and plug in the speaker. It is fine to let the extra wire lay freely inside the bodywork, provided you have insulated the wires properly.



Place the speaker in the hole and then place the speaker surround over that. Secure the whole assembly with the 4 screws.





Push the grill into the surround.

After you have fitted the first speaker. Turn on the stereo. Adjust the fader to the back and then select balance. Turn from left to right and you will hear the difference between the original and the one you just fitted.

Remember, you've only spent \$50 and you've only got \$25 worth in at this stage. I was quite impressed.

Finish reassembly by fitting that plastic rivet into the trim which resides under the seat cushion. Go into the boot and fit the 2 black plastic rivets that hold the boot trim to the internal trim. Refit the seat cushion and bolt.

That's it! Now do it all again on the other side.

This time when you turn the stereo on, you will actually be able to hear sound along with some bass coming from the rear, even with the fader set to "0".

Conclusion

For what I paid for these speakers, I have found they have improved the audio 10 fold from what it was. If you chose to go for more expensive 4" speakers than I have, then that is fine too, but I would recommend sticking with 4" because any bigger will mean you will have to do a lot more cutting and it might not be as easy or as tidy. However if you did choose 6.5" speakers and were happy to do the extra work, I am sure the sound would improve even more.

Fortunately, there is plenty of depth and open space in the body to allow for larger speakers.

It is still not a brilliant stereo, but this now meets the minimum requirements for me to want to push the power button and leave it on for longer than 2 minutes and will be pleasing enough for the average listener, but not the "purest".



Tech.