Sound Dampening 2008 VW GTI

2009/03/07

Introduction:

This document is a collection of my notes and various links to other articles that outline how to sound dampen a 2008 VW GTI. I am not responsible if you damage your vehicle following these instructions and don't claim to be a VW tech nor do I claim that this is the "best" way to sound dampen a vehicle. However, I do think that this is a good start for anyone who wants to do this modification and I am happy with the overall outcome (see: Part 7: Results).

Also thanks to everyone who posted the other various "how-to"s that encompass this document. Without their help I would not have been able to do this job. I did "borrow" some of the diagrams when I thought they were helpful.

Tools Needed:

- Torx bits
- Triple Square
- Nylon Pry Bars
- Screw Drivers (flat head/philips)
- Needle Nose Pliars

Materials:

- RAAMmat (1 roll), 1 roll was exactly enough.
- Ensolite Foam (8 yards), though I had a small amount left over
- Adhesive Spray (2 cans), I actually used one and a half cans

Product	Unit Price	Qty	Total
RAAMmat BXT™ rolls	109.16	1	$109.16
Ensolite™ MLC yards	11.06	8	$88.48
V&S Spray Adhesive cans	7.66	2	$15.32
	Sub Total		$212.96
	Shipping: UPS Ground		$59.20
	Grand Total		**$272.16**

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Part 1 – Rear Seat Removal:

More information can be found here:
http://golfmkv.com/forums/showthread.php?p=902339&posted=1#post902339

1). Remove all items in hatch: spare tire, foam inserts, hatch flooring, etc.

2). Remove the seat back first

1. Behind the rear seat, remove the plastic cover over the rear seat

2. Once the cover is off, unscrew the bracket w/ t30 torx

3. Seat backs slide toward the middle of the car. You need to wiggle them up just high enough to clear the opposing sides seat and then away from the wall.
4. Remove the seat belt triple square bolt. When re-assembling later on, this bolt should be torqued to 40 Nm

3). Now that the seat backs are off, remove the four plastic clips (they pull toward the front of the car). I found it easier to get these clips off once the rear seat backs were off.

4). Now pull the seat bottom up, hard. Don't push or pull the seat bottom or rock it back and forth, otherwise you will break the plastic clips. Pull the seat up toward the ceiling hard and the clips holding the seat down will pop right out.
5). Thats it, seats are out. Be careful not to get the seats dirty or to scratch or damage the leather.

Part 2 - Rear door Side Trim Removal:

1). Using a nylon pry-bar, carefully pull up the side trim piece near the base of where the seat belt fastens to the floor.
2). There is a clip about mid way up the trim piece, just pull the trim piece away from the body of the car.
3). Towards the top of the trim piece there are two screws. Gently pry the trim piece up so you can see up under the trim piece. You will see a plastic door that can be pushed out very easily from the inside, reach up and push the piece out.
4). Unscrew the holding screws.

5). Remove the trim piece, repeat for the other side.

Part 3 - Hatch, Side Trim Panel Removal:

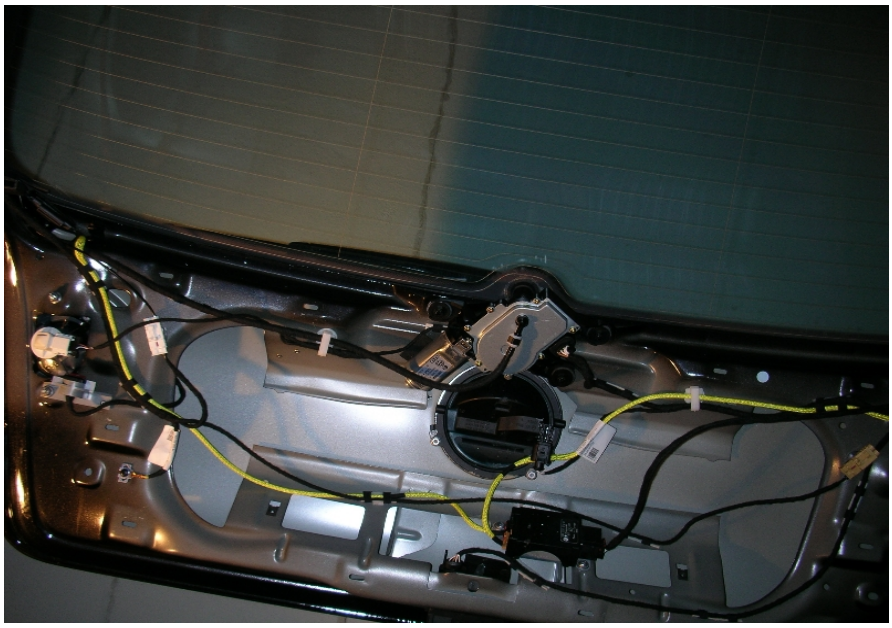
1). This part is pretty straight forward.
2). Just pull the side trim pieces away from the wall of the car.
3). The right trim piece is connected to a light and a 12V cigarette lighter outlet.
4). There are three plastic clips on each of these.
5). During reassembly I lined up the clips as close as I could and then I reached up behind the trim piece and used my finger to guide all three clips into place one by one. Then once all clips were in place the whole unit just slid back into place.
6). This is the left side once the panel is removed:

7). This is the right side once the panel is removed:

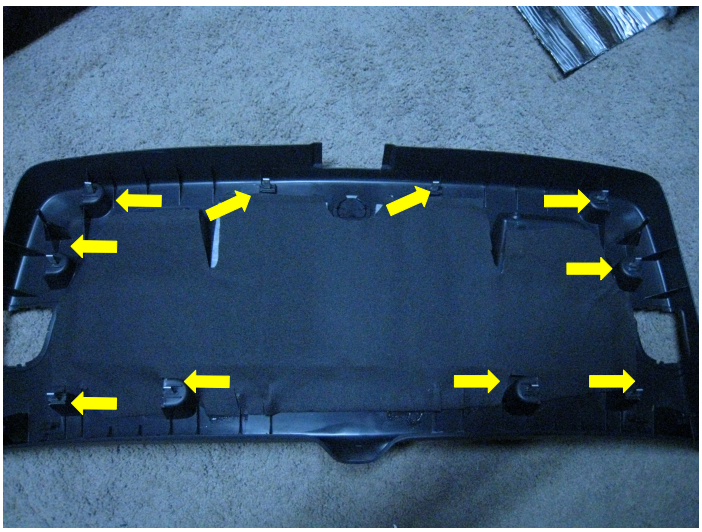
8). When you get to the plastic trim piece that covers where the hatch latches to the vehicle be very careful. There is a tab inside the hatch, in the middle, under the hatch latch. Next unclip the sides of the trim piece (pulling away from the body of the vehicle) and finally the bottom (pull up away from the the vehicle). This picture shows where the tabs are.

Part 4 - Rear Hatch Interior Cover Removal:

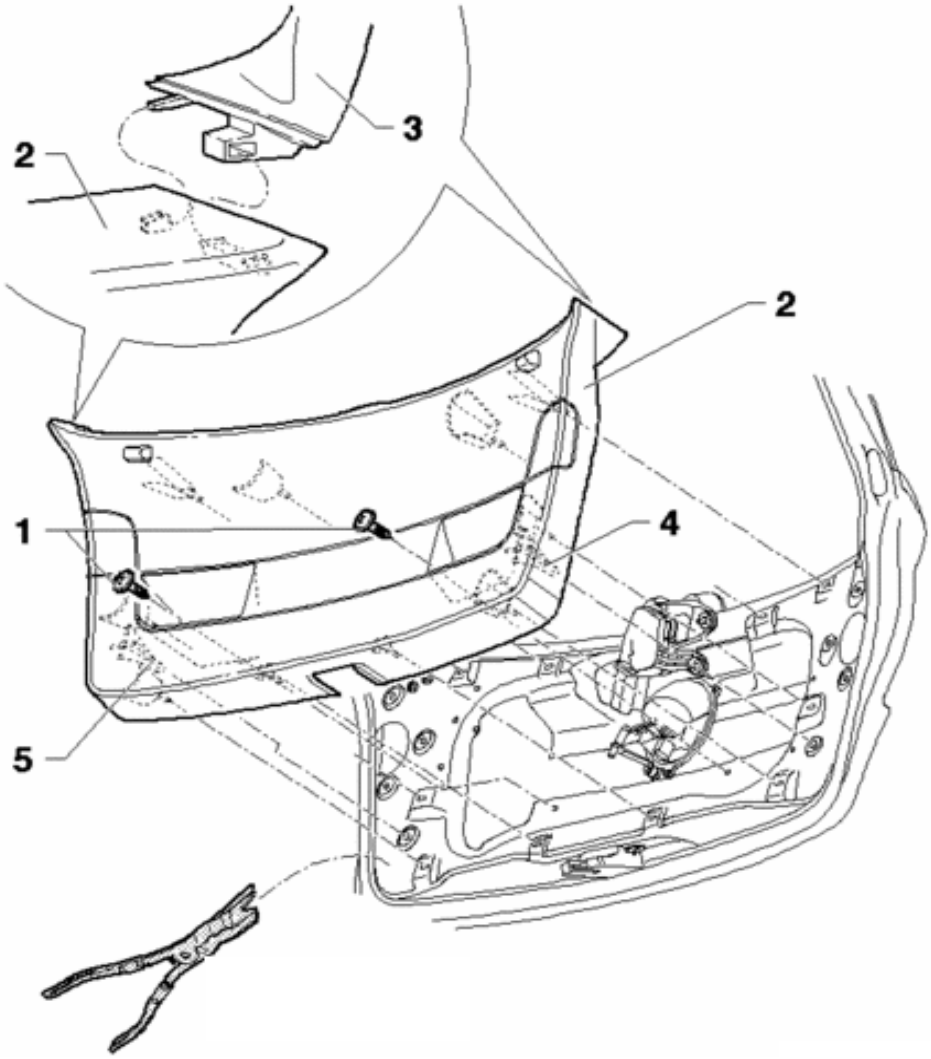
For additional information:
http://www.golfmkv.net/blog/archives/25
http://www.golfmkv.com/forums/showthread.php?t=58387



1). Remove the two screws near the grab handles of the hatch
2). Remove the plastic covers that give you access to the tail light bulbs
3). VW recommends starting at the corner, using a special pliars tool that I didnt have.
4). I started at the corner and just pulled the panel away from the hatch door. I separated all the clips toward the bottom of the door and worked my way toward the hatch window.



5). There is no easy way to do this. In fact I broke two of the clips. Keep an eye out from any broken pieces of plastic. Recover them and you can super glue them back into place. This is what worked for me.
6). You will break less if you pull perpendicular away from the door, if you can squeeze your hand up under the cover you may be able to pop each clip off one at a time.
7). After the hatch cover is removed, check for any clips that are still stuck in the door and pull them out. Reassemble the clips into the cover slots.



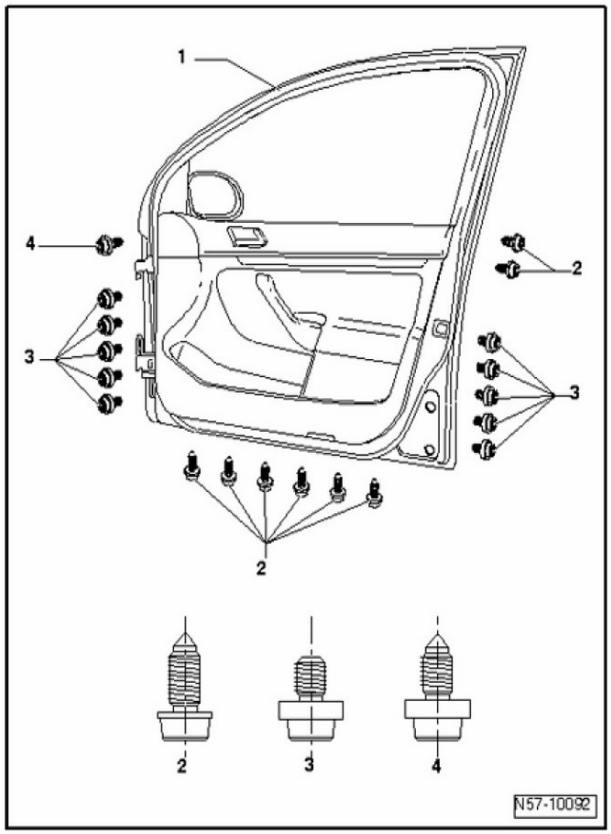
Part 5 - Outer Door Skin Removal:

Additional Information:
http://forums.vwvortex.com/zerothread?id=2984471

1). Remove the plastic cover around the edge of the door (where the latch is).

2). Be careful prying this off, if you dont pull directly away from the door you will break plastic clips.
3). Remove the sticker that covers the lock release bolt hole.

4). Now remove all the torx bolts around the door (t30 torx). Keep track of where they came from. Some are not the same and will require that they go back into the same hole during re-assembly.



5). Once all torx bolts are out its time to move to the door. Don't worry, the door shell will not fall off, its held in place by two plastic tabs.

6). Shift your attention to the door handle, this is important.

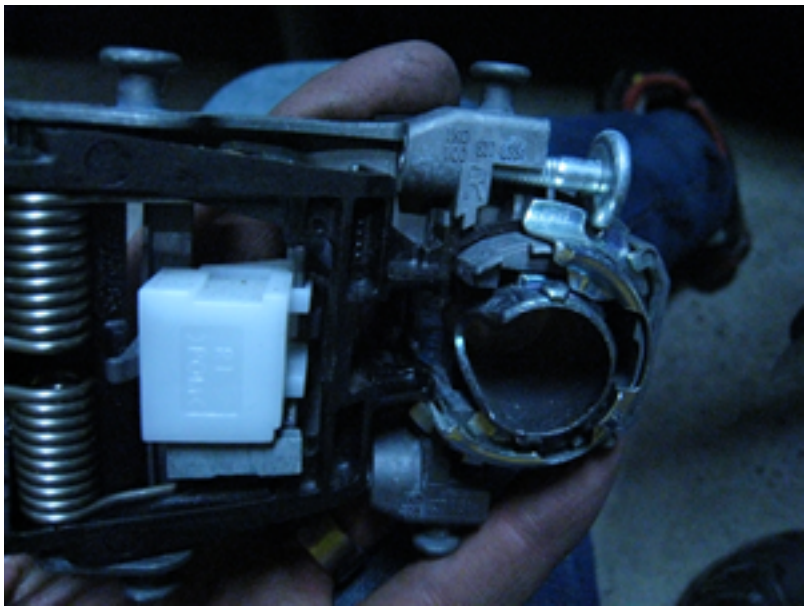
1. With one hand, pull the door handle half way open.
2. With the other hand, unscrew the lock release screw with a t20 torx.
3. The two have to be done at the same time. Unscrewing the bolt with the handle pulled causes the handle mechanism to catch and the inner mechanism compressed. This will be important for re-assembly.
4. Once the lock release screw is backed out, the lock cover will become loose and you can pull it out of the door (do this with the same hand that is pulling the door handle open).
5. Using a flat head screwdriver, pry off the cable that is attached to the door handle.
6. Pull the door handle toward the edge of the door about a ¼ inch then remove the handle.
7. Unscrew the t20 torx screw holding the door shell to the inner locking mechanism.

7). Remove the outer door skin, just wiggle it and the plastic tabs will pop off. If its really hard to take off, check that you didn't miss a bolt. On my door there was one hidden behind the wiring shroud in hear where the hinges are.

NOTE: I had a lot of trouble re-assembling the door handles. My problem was because there was too much sound dampening material on the inside of the door skin. This was keeping the inner door mechanism from being flush with the door skin and preventing the lock cover from catching properly

when the lock cover screw was tightened. I took the door apart 3 different times before I realized what the problem was. During re-assembly, ensure that the door handle is connected back properly before screwing in all of the torx bolts. This will save you time taking it back apart in case you run into a problem. Also if you have a problem, take the door lock out of the door and examine how it works, this may clue you into what is wrong with your re-assembly.

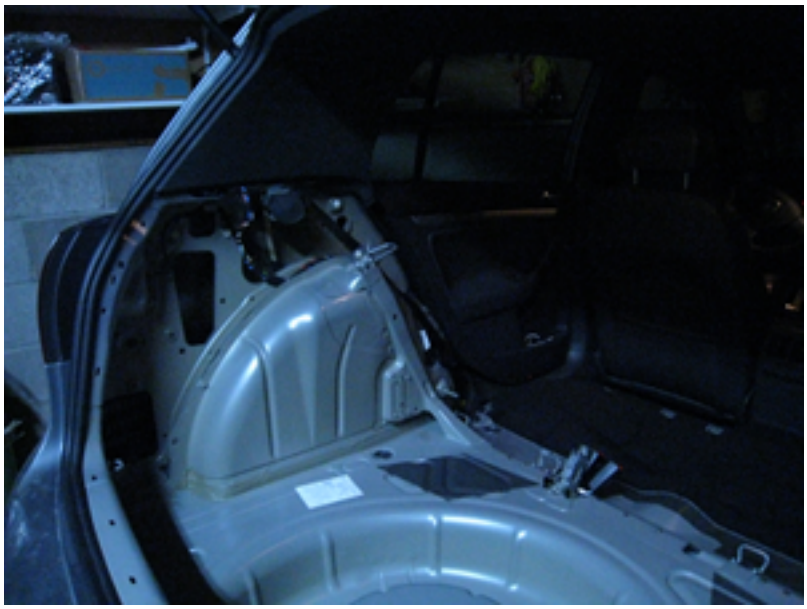
A view of the door latch. This picture shows what the inside of the mechanism looks like. This is the backside that you cant see until you get the door skin off and can look from the other side.



Part 6 – Sound Proofing:

More Information: http://www.raamaudio.com/cgi-bin/index.cgi?p=ht

1). At this point the interior of the vehicle is stripped of all trim pieces, seats and upolstery.
2). I found that using a utility knife was much easier than sheers/scissors. Also, I have a large piece of carpet in my garage that I used to cut on. This carpet was especially helpful when working on the outer door skins.



3). Cover everything you can with the RAAMmat. Be careful not to cover any holes that you need to use during re-assembly. I didnt worry about covering up holes that I wasnt going to use. I dont plan on taking this apart again so I figure that I dont need them.
4). When doing the side walls, reach into any holes that are large enough to fit your hand in and put the RAAMmat on the inner side of the outermost sheet metal of the car.

5). Cover everything with the Ensolite foam.
6). Specifically I took care to cover the wheel wells very well as most of the road noise comes from the wheel wells. I actually double covered the wheel wells with Ensolite (as I had lots extra of the Ensolite). This picture shows what it looked like after one layer of RAAMmat and one layer of Ensolite.

7). The outer door before.

8). The outer door after.

9). The door skin covered with RAAMmat.

10). The door skin before re-assembly. I actually had issues with getting the door back together. One layer of the RAAMmat and one layer of the Ensolite were too much and the door handle wouldnt seat properly because there wasnt enough clearance. This is why there is no sound proofing near the door handle.

Part 7: Results

First Impressions:
My first impressions after the modification was that there was a huge difference. When you close the doors the sound is quite different. The vehicle sounds more solid. Once I drove the vehicle I found that I no longer had to adjust the volume on the radio between suburban neighborhood driving and highway speeds (previously I had to hit the up button on the radio 2-3 times).

Verification:
The plan was to take decibel readings in the vehicle at various speeds and gears before the modification and then the same readings after the modification. I was hoping to verify the other decibel readings people had taken during their modifications. I also wanted a way of verifying that I wasn't just telling myself what I wanted to believe and quantifying the results in a scientific way as possible given that I don't have access to a fancy lab.

My tests were done using this decibel meter:

Radio Shack: Digital Display Sound Level Meter: Model 33-2055
http://www.radioshack.com/product/index.jsp?productId=2103667

The before and after readings were the same in some speeds/gears, worse in others, and there were some that had no change. Here are my results:

Speed	Gear	OEM (dBC)	OEM (dBA)	Modified (dBC)	Modified (dBA)
0	0	70	<50	71	<50
20	2	78	63	78	63
30	3	80	62	79	62
40	3	82	65	82	65
40	4	81	64	83	64
40	5	81	63	83	63
50	3	83	69	84	69
50	4	83	67	83	68
50	5	83	66	83	67
65	6	85	69	84	68
70	6	86	72	84	69
75	6	88	75	85	71

Speed is in mph
OEM and Modified are in decibels

I tried to be as scientific as possible with my tests:

- Same speed / gear
- No radio
- No heater
- Same roads (Asphalt, no bumps)
- Same tires
- Same position of the decibel meter

Summary:
1-4 decibel difference at speeds above 50 mph. The added weight of the sound dampening materials is about 35 lbs.

Interesting Facts:

1). http://www.oshax.org/info/articles/decibel-levels

Part 8: Futures

1). I didn't do the door inner door skins. At some point I do want to sound proof these as well. This would be a good project to do when installing new speakers.
2). More Information:
    1. (Missing Images) http://forums.vwvortex.com/zerothread?id=2749615