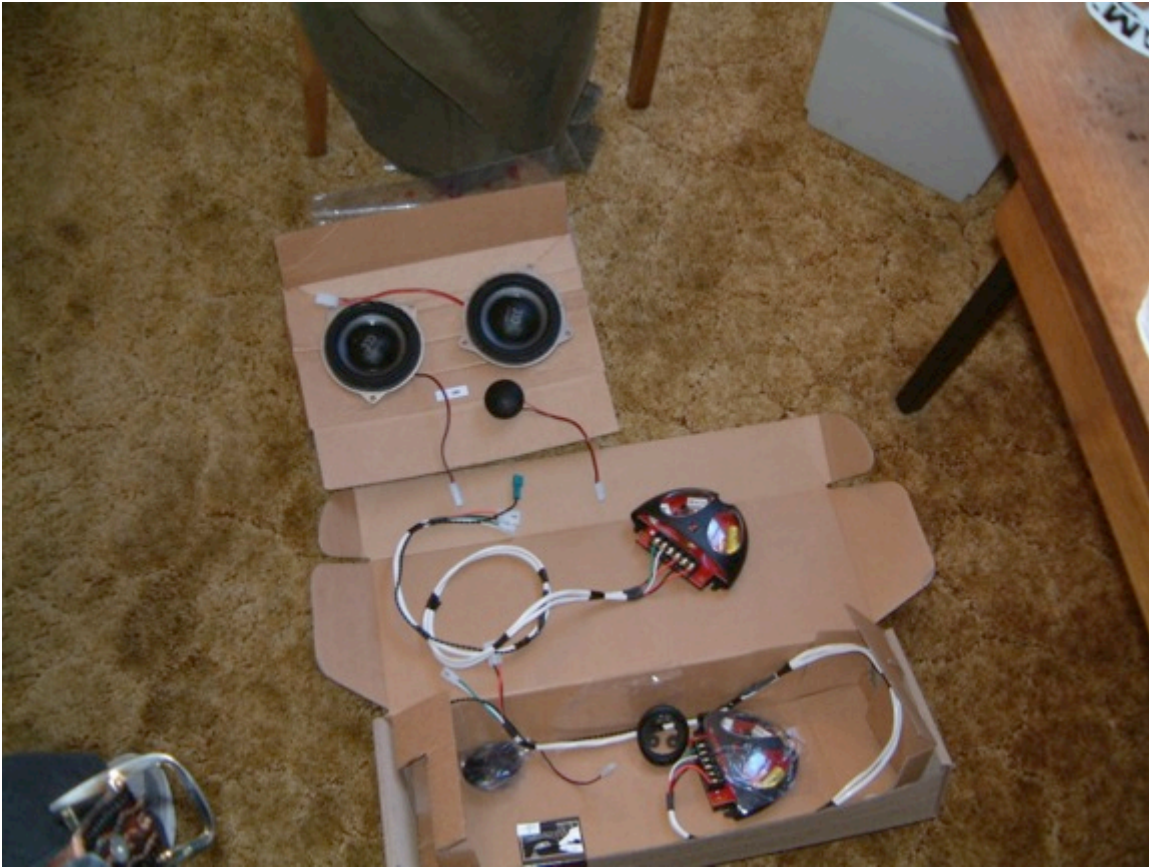


My E91 VP Kit install



The Dotech 4 with crossovers the crossovers are set to -3db

The reason for -3db the quote from VP is
"I set the tweeters to -3dB on all the Morels. That's not -3dB from the mid,
that's -3dB from some mythical reference level. To my ear, after the
tweeter breaks in, the -3dB setting sounds best in the E9x and E82 with the
tweeter on-axis (that makes it louder at many frequencies). Most
reference levels are chosen with the tweeter off-axis to the listener,
parallel to the door."



Jehnert Speaker with Factory Connector



Amp mount upside down with rubber feet positioned such that they will engage the vibration isolators that BMW had for the original mounting bracket. When I prefitted the board I could tell it was drooping to one side so I put spacers under that side till I could see it was level and used the stack to determine the height about a half inch. I placed furniture feet sliders on top of the isolators with Velcro then positioned the board over the rubber isolators to get them in the right spot .



JL XD 600/6 mounted to the Amp Mount Board with Technic Harness

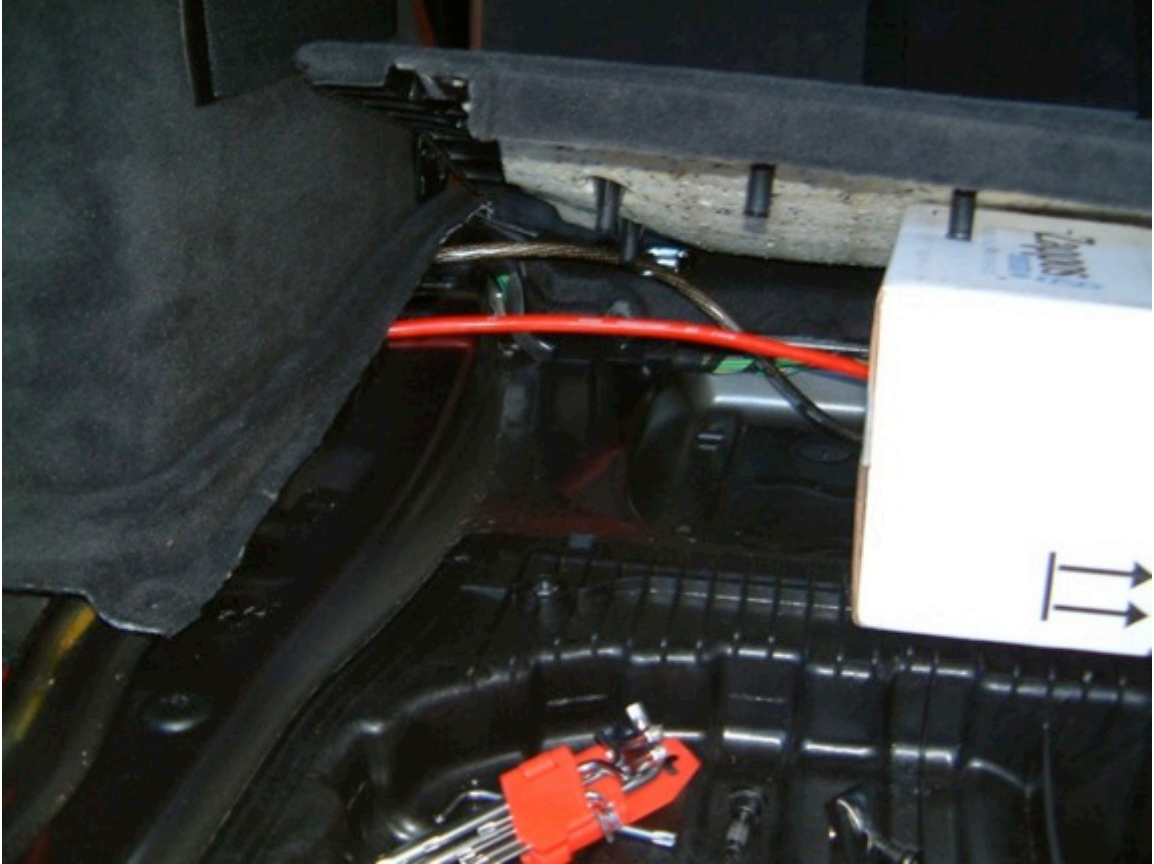


Oem Amp location in the E91 Note the Rubber bumpers there are three of them the stock frame sits on them for vibration isolation. When building or using a Amp Mount try to use them if possible . The third is not shown to clearly in this picture its just past the closest left corner in the amp area.

The Power Cable Routing

Up over the Driver Side Wheel well and across the floor in the TCU area back up over the other Wheel well and down to the battery.

This was kind of a puzzle for me in the E91 as I had seen lots of DIY's on cars with trunks and had installed a cassette retrofit on my E46 which required a retrofit panel and mounting brackets. I looked at pictures on Real Oem but could not quite figure it out and then the light bulb went off. I didn't have to remove the panels just loosen them at the bottom . I actually practiced routing the cable with some similar sized stuff before I ordered the kit. It was kind of a pain to get the tie wraps for the power cable in above the wheel well by feel. Also there was a sharp piece of metal sticking up on the drivers side wheel well above the ground point . I wrapped that in Velcro. Why the long ground cable to the battery I was told that the closer ground points were subject to EMI. Theory says to use a short ground but I do not question the Master.



Left side from back Cable Routing

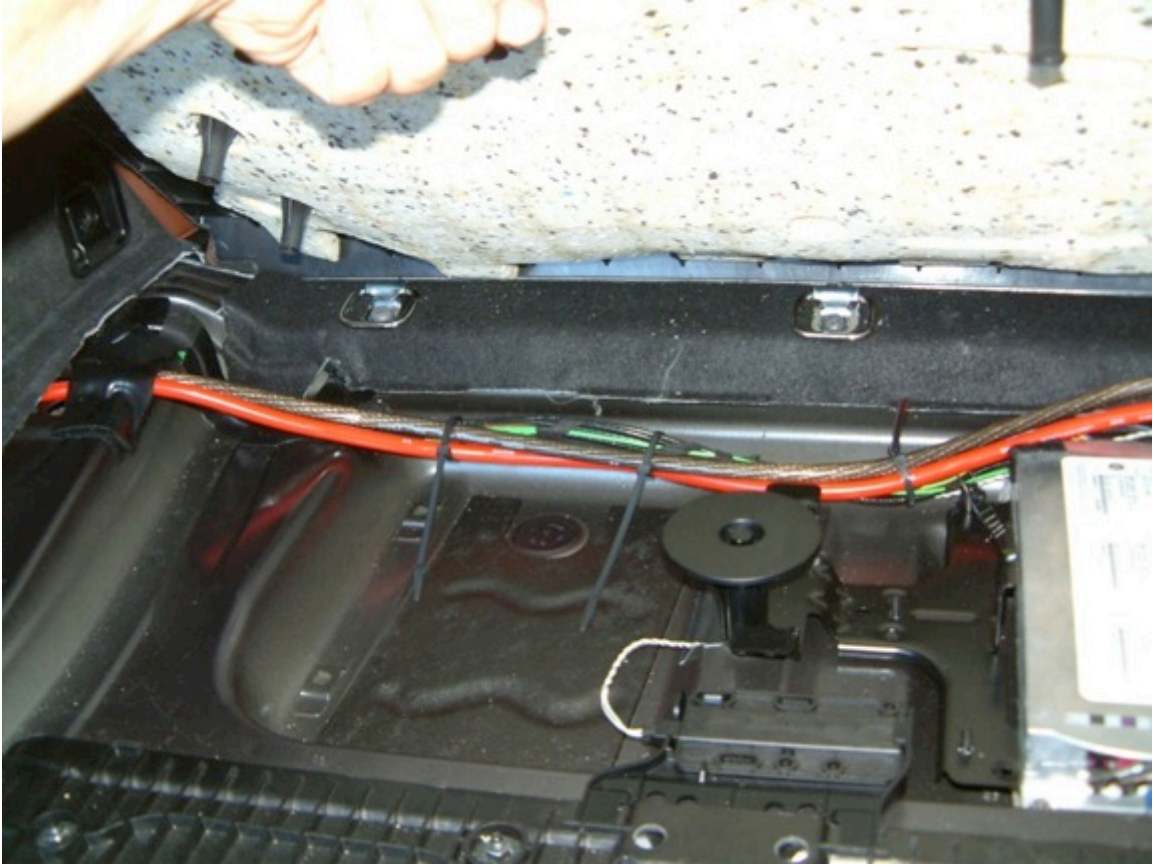


Right Side Cable Routing

To get the panel loose at the bottom you need to remove the guide rail for the Trunk Cover a Plastic Pin and the Cable Tie Down Point(it uses a T50 Driver



Right Side neatened up I used Velcro right at the point where the cable goes under the Trim to keep the cable in place . I also put a piece on the sharp corner of the TCU(I guess its the TCU or bluetooth) out of paranoia that the power cable would rub up against it.



Left side neatened up I did cut the excess cable tie.



Power cable eyelets connected directly to the tightening bolts on the Battery Lugs. This is where I had my first panic attack as I couldn't get the battery lug to tighten and ended up powering down the car. I looked at it and realized the battery connector was not all the way down at the lug which is why it wouldn't grip the battery terminal. The side benefit was I powered the car down reset the adaptation values and now the car seems to run better and the in town and gas mileage is up by 1 to 2 miles per gallon. The car will reboot and I had the AWD error that goes out by the time you get to the end of the block. The only thing I seemed to have lost in the reset was the time of day and I think I lost the trip computer data. Also had to turn on the temperature control display.



The amp installed (note I put on some masking tape and marked the initial values of the gains . I think I would need a machine to do a better job of the setup than VP did)
You can see the other shock isolator in this picture to the left of the nut holding down the amp mount board.



power cable routing with tie downs.

Meter Checks and Power Up

I use my meter to record initial values of speakers and verify that those values appear in the right places . If anything goes wrong I have a chance of finding it.

Stock door speakers measured 3 ohms at the amp tightening screws

Stock under seats measure 2.1 ohms at the amp tightening screws

Dotechs measure 3 ohms at the amp tightening screws

Jehnerts measure 6.2 to 6.5 ohms at the amp tightening screws

I also checked the Power Cables for Low Resistance

Power Up

Upon power up Music without any noise was heard.

I ran the system for a couple of days with just the stock speakers and my observation were.

The muddiness and harshness went away and you can actually here some bass, but the numbers say you will fry the speakers.



Is it safe?

The Door Panel Removal Install Tips

I won't go into a detailed description of how to remove the door panels here because its well documented in the DIY's found on E90 post and all the other resources on the net. I think that most people fear removing there doors and the under seat replacement most of all. (see useful links on last page)

Some things that I did and that might help you are the following.

- 1) Prepare your work area for the door panels before you take them off.
- 2) Find a small cardboard box that sits about 1 or 2 inches below the door panel to rest it on when it is finally detached put an old blanket over it.
A chair also is a good thing to sit on while taking off the door and removing the connectors .
- 3) The driver side switch cluster has a small version of the same type of connector as the Amp Wire Harness . Its easier to work with it if you have all the other cables detached. You can then rotate the door panel 180 degrees and look right at it. This is what I did the second time I attached the driver side as the first time I reinstalled the door panel I had no window action. The second time I also tested that I had some window action just moving the window up and down a little before putting the driver door panel back on.
- 4) Check all the functions of the door after you reinstall it.
before you go on to the next one.
- 5) Take pictures of the way the door fits for each side at the tweeter .
On my car there was about a two credit card gap on one side between the tweeter and the top of the door panel and a one credit card depth on the other . That kind of stuff drives me nuts and I probably would have gone around in circles on that if I didn't know it was like that before.
- 6) The plastic rivets that hold the door panel in place can move around in there holders . If there not aligned they will break . I broke 5 the first time.
I found actually looking to see they are aligned over the holes and working from top to bottom on each side worked well , You can put a little English

on the panel to make it align .

7) If you buy spare plastic pop rivets and you probably should there are two types one with a seal which is a gray color and one they call natural which is white . Why not get some of both there only 70 cents each. While your at it you might as well get some of the plastic fasteners for the trunk area some of the door, sill fasteners and some of the long speaker screws for the under seat speaker grills as they are the type that the head can strip out on pretty easily.



Note cardboard box with blanket for resting the panel on once the panel is detached.

The tweeter install was super easy I just pulled back the front portion popped out the foam the tweeter snapped right in put the foam back in repositioned trim Use some Hot Glue to secure the tweeter if necessary or for added reliability.

note you just put in the raw tweeter not the screen that comes with it.



A chair gives you a better position for panel removal and wire detachment.



In order to get the crossover to fit in a nice flat secure place you need to remove the foam piece in the bottom of the door and scallop some of the foam out. To remove use one of your plastic pry tools to get it started then use your fingers to work it out. Some foam will be left behind use a razor blade to scrape out the residue. Position the crossover where you want it apply the Velcro and put the crossover in place. I positioned the foam over the crossover put some masking tape on the foam to define the outer edges of the cutting area and then started carving out as much foam as I needed to get a nice fit.



Cross Over in position Mark 1 Phaser Dremel Tool above. Phaser equipped with cutting Disk it took me some time but my technique improved when I realized it worked better if I didn't try to go to deep with each cut stalling the wheel.

I used 3M super 90 to Glue the Foam back in place.
(This didn't work so good on taking the panel out the second time the foam dropped out . I think I would try Velcro next time)



VP supplied gaffers tape holds the wiring in place. The one thing I'm a little ashamed of is my cursory use of sound deadener. I don't think that crossover will be moving around in the door panel.

Note after playing the system for about a week I am not getting any rattles so I guess its either not necessary or sufficient sound deadening.



Note the speaker posts are not evenly placed around the circle so it won't fit this way, rotate the speaker till it does . The speaker rotates within the frame so I tried to position the speaker so the Morel sign on the front of the speaker would be level if you could see it from the inside of the cabin but you can't as far as I can tell.



Door number 2 the sound deadening was a little better.

Sound Test with Dotechs and Stock Speakers.

Well I had to fade out the rears and set the bass to -4
The Dotechs are providing detail and dynamics that the stock speaker cannot.
The High end is sparkling and you can here nuances and timbers
that the stock component set is incapable off.

The Under Seat installation

This is another area where the Fear Index Rises

Fear One damaging your Leather

(I put blankets or bubble wrap down where I thought things might touch or scratch)

Fear Two damaging your seat mechanism

(The seat rails and the mechanism are pretty beefy so you can lean the seat back without any big worries)

Concern One If the seat connector is disconnected while there is power to the car it will cause a seatbelt error that has to be reset by the Dealer or an Indy or if you

have a Bavtool I think you can reset it.

Also the DIY's on e90post had some pictures with the seat in the back position when they said it was suppose to be in the foward position.

(see useful links on last page)

What I did

- 1) I did not power down the car.
- 2) Position the Seat in the most upright position to lean it back further
- 3) Slide the seat all the way back and take out the Front Hold down screws
- 4) Slide the Seat all the way forward and take out the rear Hold down screws
- 5) Put a Blanket or Rug behind the seat so you have something to protect the floor
- 6) Slide the seat back on to the rug about 4 inches
- 7) Optional you can take out the rear seat cushion very easily its held by two clips in the front one of each side of the car . You might as well clean out the under seat area in both the front and rear while your doing this.
- 8) Use something to prop up or hold the seat in place .
I found out on the second seat that is was easier to use a roof rack strap to hold the seat in place and give my self more working room.
- 9) Pull up the Door Sill
I did this by just pulling up with my hands on it.
- 10) Pulling the Speakers out is well documented on E90post in the DIY Section so refer to that.



Passenger Seat Propped Up



Under Seat Speaker Housing with Foam Seal applied



Under Seat Speaker Assembly with Jehnert

I used hot glue where the wire goes into the plastic spacer to seal that hole.

The assembly is pretty easy to get in and out you do spend a lot of time getting the speaker grill assembly screws in . I had a miniature ratchet with the right Phillips bits that made this easier.



The Anchor Point for the middle seat belt wouldn't budge even with a breaker bar so I only had it out for the passenger side.

Its a good opportunity to clean the garbage out from behind the seat.

Also a cigarette lighter fell out from under the front seat worm screw area and there hasn't been any smokers in the car . That may have saved me a lot of money.



This turned out to be a better way to hold the seat back
Its a tie down strap for a roof rack.



It gave me a lot more room to work in .

The Door Sill Cover Reinstall



You can see the 4 white door sill pins in this picture

You need to remove them with the pry tool and slide them in to the cover.



Door Sill pins in Cover

To install place the cover over the area line up the pins with the holes and press down.
The install is done at least physically.

Sound Test with Jehnerts installed

I don't think I have ever heard better bass.

It's really defined with and focused without being boomy . On some of the newer music with a lot of bass content its a little overwhelming compared to what I am used to.

The overall sound now is very three dimensional .

Kick Drums Kick , Bells tinkle you can hear the attack decay and reverb , timbre and nuances of all notes.

Pictures of Tools and materials



Chapman small ratchet with Phillips bit
for floor speaker cover also used regular short screw driver for that to
Dremal Tool
Razor Blade
Roller for Sound Deadening
Dremal cutting wheel
T50 Driver for Seats
T20 Screwdriver type driver for Doors
Torx allen set for various stuff
Inspection light
Pry tools
The rest is socket set stuff

More tools and materials





3M Super 90
Cheap Glue Gun
Gaffers tape from VP
Velcro and sounddeadner (not shown) from
<http://www.sounddeadenersshowdown.com>

The following BMW fasteners are a good things to have on hand especially if you live far from a dealership , are doing work on a weekend.



From left to right and top to bottom

BMW Part no

51-41-8-224-768 b71d clip wi .71 ea door fastener natural

51-41-8-224-781 b71d clip wi 1.05 ea door fastener with seal gray

51-47-7-117-532 b18d clip wi .91 each door sill fastner

07-12-9-905-172 dp screw .71 each speaker grill screw

I didn't strip any heads out on these but they are soft

07-14-6-979-835 .71 Fillister screw under door trim

One of these was missing on my car

other useful links

[my install/DIY \(Morel, Jehnert, Arc Audio - many pics\) - BMW M3 Forum \(E90 E92\)](#)

[DIY: Front door lock actuator replacement \(E90\) - BMW 3-Series \(E90 E92\) Forum - E90Post.com](#)

<http://www.e90post.com/forums/showthread.php?t=30305&highlight=DIY+door+panel>

I used the above two for panel removal but removed the door cable at the latch

<http://www.e90post.com/forums/showthread.php?t=163804&highlight=speakers>

The last link is for the method to remove the under seats once you get the seats up only



I been effective here