

BMW E38 Subwoofer System Installation Guide: d112.e38 for BMW 7 Series '95-'01 (E38) – with Premium Sound (DSP)

Tools Required:

- Panel Removal Tool
- Torx Driver Set
- Small, Straight Pick Tool
- Metric Wrench / Socket Set
- Small, Flat Head Screwdriver
- Philips Head Screwdriver
- Wire stripper / crimper tool
- Drill (for amplifier mounting)
- Roll of black electrical tape

Before you get started, please read these instructions start to finish. By familiarizing yourself with the installation process, you'll know what to expect each step along the way before you get started – and make sure you have the appropriate resources to complete the job.

Rear Deck and Factory Subwoofer Removal:

Keep in mind this takes an experienced installer about 15 minutes. It should take you between 30-45 minutes, depending on your experience with vehicle disassembly.

We won't be reinstalling the subwoofer enclosure, so put it away in the garage somewhere.

First remove the bottom of the rear seat by pulling upward on the front of the cushion. There are two hooks on either side that need to be disengaged. This is super easy to remove. (See arrows)



1. You'll next want to remove the back portion of the backseat. First remove the three headrests from the seat cushion. Do this by lifting upward on each headrest. You may find it easier to pull up on one side at a time. This seems to work best if you don't want bust a vein in your forehead while trying to remove those headrests.
2. Now locate the 10mm bolts that line the underside of the seat which secure the cushion to the rear firewall. There are bolts on either outer side of the cushions where the cushion meets the sides of the car. Two nuts will also secure the arm rest portion toward the center of the seat. There is also a nut underneath the center of each side cushion. Remove all of these.
3. You'll want to remove the back seat in three pieces. Start with the outer sides, and remove the center portion lastly. Lift each piece upward and outward towards the front of the car.
4. The seatbelts can be removed as well on the passenger side just to make your life a bit easier. A 17mm bolt secures the seatbelt assembly. Remove this.

Removing Interior Pieces:

You'll also need to remove the C-Pillars on either side of the rear windshield.

1. Using a panel removal tool or flathead screwdriver, carefully pry outward on the top of the lighting assembly, freeing the top portion. The bottom will simply fold out toward you once the top is free.



2. Unplug the harness going into the light by gently pulling it outward from the assembly.
3. There are three 8mm bolts behind the light. Remove these.



4. Now, pull the actual C-Pillar toward the front of the car, being careful not to scratch your rear window tint. You have tinted your windows, haven't you?

Before you get much further, go ahead and pop out the speaker grilles located on either side of the rear deck. You can use your fingers here. Be careful and don't force anything.



1. Work your way around from the front of the grille (side closest to you) and around to the sides, being careful not to break the grille. Lift upward, and then toward you. The rear of the grille is simply slid underneath the deck.
2. Remove the two 2mm Allen bolts located underneath each grille.



Now, some E38's are equipped with baby seat tie downs on the rear deck. There will be three of them across the rear deck. If your E38 doesn't have these, the bolts mentioned below will be underneath the rear deck once you've removed it. They will still need to be removed.

1. To remove the tie downs, you'll first pop off the plastic cover that sits atop the circular rear portion of the hook. Simply use your panel removal tool or your fingers if you're really tough.



2. 13mm bolts will be revealed, and you'll need to remove them using a ratchet or wrench.
3. Notice the four black plastic anchors that run along the width of the bottom edge of the rear deck. (See arrows) These need to be removed. Now the rear deck is free. Simply pull it toward you and out of the vehicle.



Factory Subwoofer Removal:

Now we just need to remove the subwoofer assembly. Can you believe that thing is so huge? Where was the bass?

1. Remove the two 8mm bolts on either outer side of the enclosure toward the front of the car.



2. Remove the black plastic anchor in the center of the enclosure using your panel removal tool or flat head screwdriver.
3. On vehicles equipped with the factory baby seat tie downs, you'll also need to remove an additional 3 13mm bolts on the backside of the enclosure.



4. Now, lift the enclosure upward and pull it towards you. We'll need to unplug it before we can remove it. The plug is on the driver's side underneath the enclosure. Remove the enclosure. Here's what you'll see with the factory subwoofer removed:



Tip: Don't put the deck back in just yet. We recommend installing the entire subwoofer system and testing it out before doing so. Trust us on this one.

Trunk Disassembly and Wiring Connections:

We'll first need to remove the Navigation Unit and its trim ring before we can remove the side panel from the car. So, let's get started.

1. Using a radio removal tool (available at any auto parts store) insert one tool into each side of the navigation unit. Pry each tool outward and slide the navigation unit out. Unplug the harnesses and navigation antenna.



2. Now, we'll need to remove the trim ring from around the navigation unit. You'll see how it's hooked into the metal frame. Just pry it out from around the frame and pull it towards you.



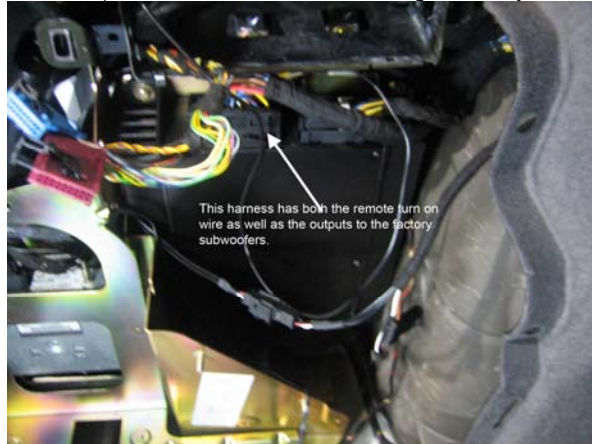
3. Now we'll need to remove the top portion of the carpeted panel that was covering the CD changer and navigation unit. Simply pry the panel from around the navigation cage and CD changer outward. We'll need to unscrew the two black plastic fasteners at this point.



4. Lift up the carpeted liner on the floor of the trunk and you'll notice two black plastic fasteners attaching the bottom part of the panel to the floor. Remove these and the panel will be free to

remove from the car.

5. At this point the factory amplifier is visible and the harnesses on top of it are where we're going to make our connections. (We've removed the CD changer here, you don't have to)



Mounting your new Amplifier

Fortunately, with the 7 Series, there's plenty of room to mount the new amplifier. We always mount it on the back wall, typically centered about halfway up. Use the four supplied screws to secure the amplifier to the metal of the rear firewall.



Power/Ground/Remote Turn-On Connections for your new Amplifier:

*Before you make any connections, we recommend disconnecting the negative battery terminal from the battery. This will eliminate any chance electrical damage to the vehicle.

-All of the below wiring is included in your amplifier installation kit.

Power Wire (Red Wire)

- You'll want to run the large red wire to the positive terminal of the battery. The battery is located on the passenger side of the trunk behind the down panel. Loosen and remove the 10mm nut on top of the terminal that secures the actual terminal to the battery. Put the amplifier power wire ring over

the bolt, and tighten the nut back down with the terminal on the battery. This is the primary power supply for your new amplifier. This wire will be connected to the +12 terminal on the amplifier. Do **NOT** put the fuse into the fuseholder until you have connected the other end of the wire to the amplifier. Once you've made this connection, it is safe to install the included fuse into the fuseholder.

Ground Wire (Black Wire)

- The large black wire goes to a chassis ground. This essentially means metal. Ideally, the ground needs to be on the battery side of the vehicle, securely mounted to the chassis on a paint-free surface. If it isn't practical to ground the amplifier on the driver's side due to amplifier mounting location, you can ground it on the passenger side; just make sure it's grounded securely to the chassis or on a frame rail. You can just use a screwdriver to scrape the paint off of the chassis railing, and ground the amplifier there using the provided self-tapping ground screws. Be sure to look for any wires or fuel lines before you drill. This wire will connect to the GND terminal on the amplifier.

Remote Turn-On Wire:

- Now, for the remote turn on wire, locate the small gauge white wire going into the factory amplifier. It's in the larger of the two harnesses on the left as you look at the amplifier. (See photo above) entering into the top of the amplifier. The wire will show 12 volts when the radio is turned on and no voltage when the radio is turned off. This wire acts as the system turn-on wire. Tap into this wire with the blue remote turn-on wire provided in your amplifier wiring kit using the supplied red butt connector. This blue wire will go to the turn on lead on your amplifier, which is marked REM.

Getting the music to your new amplifier (LOC Connections)

This part of the installation is the most time consuming. By time consuming we mean 10 minutes. Use the supplied blue butt connectors to make the connections.

1. Carefully observe the factory amplifier. You will see a large bundle of wires going into the amplifier. The harness contains several wires, but don't be overwhelmed. We will be using only five of them, and they are easy to locate.
The input wires will be twisted together, and each twisted pair represents a speaker or input to the new amplifier.
These wires can also be found at the plug that you removed from the factory subwoofer enclosure. It is easiest to make your connections here. The LOC can live in the rear deck where the factory subwoofer enclosure used to reside. We recommend making your connections here.
2. You'll need to isolate the following four (4) wires. They will be twisted together in pairs, or placed alongside one another in the plug that connected to the factory subwoofer enclosure.
-Blue (+) twisted with Brown (-)
-Yellow (+) twisted with Brown (-)
Now, you may not see these exact colors in your harness. The wires above are in most cars. BMW seemingly used whatever wires they had in the factory that day. Here's a quick guide to determining the correct polarity (+,-) we'll need to use.
-If you see any wire with a black, red, or purple stripe, it's positive (+)
-If you see any wire with a brown or grey stripe, it's negative (-)
3. Now, orient yourself with the Line Output Converter (from here on out referred to as LOC) that you received with your order. There are four individual wires coming out of the unit.



BAVARIAN SOUNDWERKS

Purple (+)
Purple w/Black Stripe (-)

Green (+)
Green w/Black Stripe (-)

So, the connections will essentially be as follows:

Wire Color at LOC	Wire Color at Factory Subwoofer Plug
Purple (+)	Blue
Purple/Black Stripe (-)	Brown
Green (+)	Yellow
Green/Black Stripe (-)	Brown

4. You will need to strip back approximately ¼" of the insulation from the ends of the wires, exposing the copper wiring.
5. Attach the supplied butt connectors to the ends of the above wires using a quality set of wire crimpers.
6. Cut the appropriate wires at the factory subwoofer connections approximately 1" from the plug. Again, you will need to strip back approximately ¼" of the insulation from the ends of the wires, exposing the copper wiring.
7. Insert this section of wiring into the unused end of the butt connector, and your audio connections between the LOC and the factory system will be complete.
8. Go ahead and plug in your RCA cables into the LOC, and then clean up your work with a couple of the supplied wire ties. This will not only make your install look nice, but ensure that all connections will remain solid. You'll want to run the RCA cables back into the trunk through the grommet that the factory subwoofer wires are being run through.
9. Run the RCA cables over to the mounting location of the amplifier, and plug them into the input section of the amplifier. It doesn't matter which RCA plugs into which input, as subwoofer sound isn't stereo.

Speaker Wiring Connections:

- The speaker wires inside the enclosure are to go to each woofer. We have pre-wired the subwoofers for you. All you need to do is take each wire in the enclosure, one for each woofer, and make the positive and negative connections using the OUTER terminals on each woofer. Red is positive and black is negative on each subwoofer terminal.
- As for the speaker wires in the enclosure, the wire with the writing on it is positive, and the wire without writing is negative.
- Now, we need to get the music from the amplifier to the subwoofer. We'll now connect the provided speaker wire (6 foot section) between the amplifier and subwoofer enclosure. Again, use the wire with writing for positive, and the wire without for negative. We will be bridging the amplifier, therefore use A+ and B- for the speaker connections on the amplifier.

Subwoofer Terminal		Connection at Amplifier
Red	Connects to:	A (+) Output
Black		B (-) Output

Installing the Deck Mounted Enclosure

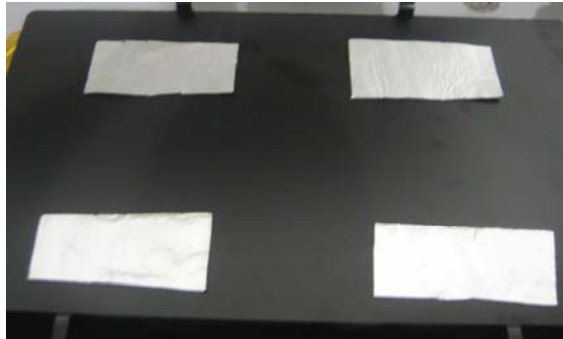
Now, keep the following in mind and the install of the enclosure will go along as smooth as silk: **The enclosure hooks into the existing holes on the front of the rear deck (closest to the trunk opening), and the rear of the enclosure then lifts upward onto bolts that we'll drop down through the existing holes in the back (closest to the front of the car) of the rear deck.**

It helps immensely here to have a friend help you secure the enclosure the first time. See step two.

1. First, we'll need to remove the black plastic inserts on the underside of the rear deck where the enclosure will mount. Using your panel removal tool, simply pry them out and put them aside. We've shown all four mounting points in the photo below. We'll only need to pry out the two front plastic inserts.



2. We'll now need to drop the included bolt/bracket combination through the top of the rear deck to secure the rear of the enclosure. There are several holes in the rear deck where the rear brackets mount, and instead of confusing you with which ones to use, it's easiest to "mock" install the enclosure.
3. Go ahead and attach the four strips of sound deadening material to the topside of the enclosure. We recommend placing two strips towards the front and two strips toward the rear.



4. So, we'll go ahead and slide the front brackets into the front holes, and lift up the rear of the enclosure to where the rear brackets sit up against the deck. While one person does this, the other person can drop the bracket/bolt combo down through the appropriate holes. This will ensure that the enclosure will mount correctly the first time. See below:



5. From the trunk, we'll go ahead and attach the quick release bolts to bolts, of course assuming that the enclosure brackets are lined up correctly.



6. Make sure that the bolts are nice and tight and that the enclosure isn't able to move. Go ahead and plug it into the speaker wire coming from the amplifier, and we can now begin tuning the amplifier.

Here's a completed photo of the enclosure installed:



Amplifier Tuning

First things first, after physically completing the installation, make sure your amplifier is powered up properly. It needs to turn off and on with the key. The power light should turn off when you take the key out of the ignition. Test this out a couple of times to make sure. If it does not, and you are having trouble figuring out why, give us a call or drop us a line. Trust us, it won't be anything major. Go back over the above connections, and you'll undoubtedly find a small, silly mistake.

Now, go to the front of the car, and turn on the stereo. Put in your favorite CD (not a burned CD, but one that was professionally mastered and recorded), and tune in to your favorite track. We recommend using a very dynamic type of music, with many types of musical variations within the CD. Make sure that your bass settings on your radio are set in the middle or slightly lower. This will decrease distortion and increase the overall sound quality in the vehicle.

Make sure all bass and treble settings on your radio or EQ are flat, or in the middle.

1. Preliminarily set the gains, crossovers, and crossover frequencies as follows:
Gains: $\frac{1}{4}$ of a turn, or roughly 9 o'clock.
Crossovers: Set the crossover to **LPF**.
Crossover Frequency: Start with 80hz.
Turn on the bass boost.

Gain Adjustments:

-Begin turning up the volume until you hear the music at a reasonable level and increase the volume slightly up to the point that you begin to hear distortion coming from your interior speakers. Now, back down the volume until the distortion disappears and stop there. Head back to the trunk and slowly begin adjusting the

gain(s) of the amplifier until you are content with the amount of bass being produced by the subwoofer without any audible distortion of the woofer. Make sure that this blends in with the rest of the music, and you're on your way to a rich, full sound.

When adjusting the amplifier gains, do everything in very small increments.

We recommend 1/8th turn adjustments of the gain to find that sweet spot where there is no distortion and plenty of volume.

Everyone listens to music differently, so the tuning process may take some of us days, while others can do it in a matter of minutes, whether they're a beginner or not.

The tuning is the most important aspect of the installation. Don't rush any aspect of the tuning. You may ride around a few days and find that you need to make some adjustments. Don't worry, this is perfectly normal.

Crossover Adjustments:

This can be tricky, but if you keep your ears open, it shouldn't take long at all.

Here are some tricks to finding that sweet spot.

Try turning up the crossover a bit to around 100hz. If you don't hear distortion, this may be a good spot for you.

Keep your ears open!

-You can also readjust the bass on the radio down a notch or two to compensate for the distortion, but again, **keep your ears open.**

Keep a fine ear out for any distortion, and once you've found that sweet spot where the volume and the fullness you desire is ideal, you shouldn't ever need to adjust the amplifier again.

Reassembly:

Listen for any rattles that may have appeared, and isolate them. While rare, they can creep up. It's the best time to find them now, while everything is still apart. At this point, it's a good time to go ahead and put the rear deck and trunk paneling back together. Only reassemble everything once you've confirmed that everything is operating as it should. Believe us, it's the smartest way to do it!

The assembly is essentially the reverse of the disassembly above. There will be four less screws however. Remember the four small screws that attached the rear of the deck to the subwoofer enclosure? Well, the subwoofer enclosure won't be there anymore, so we won't need those screws again.

Enjoy the new setup!

Make any installation notes here:

Troubleshooting Guide

Invariably you'll come across one or two things in your install that didn't quite match up or weren't perfectly clear to you. We've put together several common things that may come up during an install, and how to isolate and troubleshoot them if they do. It is very advantageous to have a digital multi-meter on hand to troubleshoot anything electrical in your BMW. They can be found at any hardware store for around \$20-\$30.

No Sound from subwoofer(s):

- The fuse wasn't installed inline on the red 8 gauge power wire at the battery. This is very often overlooked. Pop in the fuse, and you'll be good to go.
- There isn't a connection between the amplifier and the subwoofer. Did you route the included speaker wire from the amplifier to the subwoofer enclosure?
- Amplifier isn't turning on properly. See next section.

Amplifier isn't Powering Up:

- The fuse wasn't installed inline on the red 8 gauge power wire at the battery. This is very often overlooked. Pop in the fuse, and you'll be good to go.
- Check to make sure you've found the correct remote turn-on wire. This is a very common oversight. Set your DMM to direct current and place one lead on the ground terminal of your amplifier and one on the remote turn on terminal. Turn the car and the radio on. If you don't have 12-14 volts on the remote turn on terminal, your connection may be the issue.
- Make sure your power and ground connections are correct. Using your DMM, again check each terminal to make sure that a connection has been established.
 - Ground Connection:** Set the DMM to its continuity section. Place one lead of the DMM on the amplifiers ground location where you screwed into the chassis, and the other lead on the negative battery terminal. If you don't see any continuity, move your ground wire until you do.
 - Power Connection:** Set the DMM to direct current again, and place one lead on the amplifiers power terminal and the other on the amplifiers ground terminal. You should see 12-14 volts. If not, check your inline fuse.

Subwoofers sound muffled or quiet:

- Check to make sure your phasing is correct between the amplifier and the subwoofer. Positive should go to positive, and negative to negative.
- Your input signals are out of phase. Check to make sure that your input connections are exactly as outlined in the guide. An easy test is to simply cut one of the input wires and see if the sound output increases exponentially.