
BMW E39 Subwoofer System Installation Guide: d110.e39 for BMW 5 Series, M5 '97-'03 (E39) with Premium Sound (DSP)

Tools Required:

- Panel Removal Tool
- Metric Wrench / Socket Set
- Brain
- Small, Flat Head Screwdriver
- Philips Head Screwdriver
- Wire stripper / crimper tool
- Drill (for amplifier mounting)
- Roll of black electrical tape
- 4mm Allen Driver/Socket
(if no fold down seats)

We're going to proceed as follows:

1. **Removal of factory subwoofer enclosure**
2. **Mounting the new amplifier**
3. **Power connections for the new amplifier**
4. **Audio inputs for the new amplifier**
5. **Connecting the new amplifier to the new subwoofer enclosure**
6. **Installing the new subwoofer enclosure**
7. **Tuning/testing the new amplifier**

Removing the Factory Subwoofer Enclosure

You'll first want to remove the factory subwoofer enclosure in your 5 Series. To do so, you'll follow these simple steps:

1. Remove the 8mm bolts that secure the front of the carpeted cover surrounding the subwoofer enclosure.
2. Unplug the subwoofer enclosure.
3. Remove the 8mm bolts on the sides of the enclosure.
4. Slide the enclosure toward you, and it should now be free from the vehicle.



Mounting your new Amplifier

Fortunately, with the 5 Series, there's plenty of room to mount the new amplifier. We typically mount it on the back wall on vehicles without fold down seats on the driver's side of the wall. Use the four supplied screws to secure the amplifier to the metal of the rear firewall.

If your 5 has fold down seats, we will mount the amplifier on the back of the smaller seat (passenger side).

For those of you with M5's, there is a very nice option for you to mount your amplifier down in the well that is in front of the battery. You'll need to remove the tire inflator kit, as well as the foam padding down there, but it is very easy to pack it all back in once the amplifier is securely mounted down there.

Power 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.

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. This wire 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 inserted the other end of the power into the amplifier and secured the connections.

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.

- Ideally, we'll want to use an existing factory grounding point, which will look something like this:



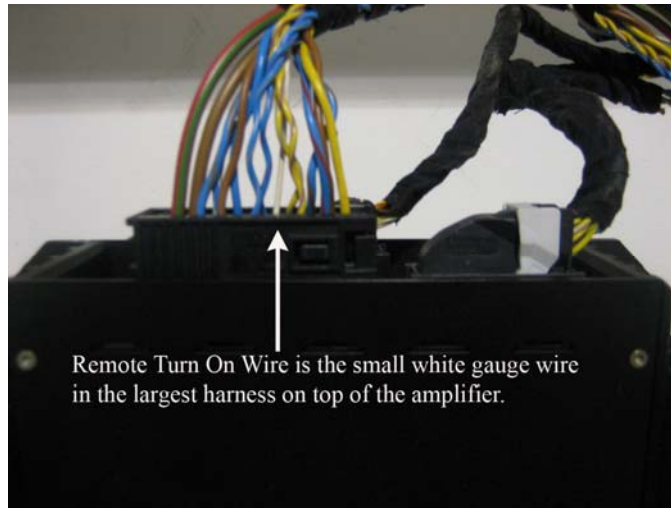
- If your amplifier mounting location doesn't have the amplifier close to a factory bolt, you can ground the amplifier directly to the vehicle's chassis using the provided self-tapping ground screws. Make sure to scrape any excess paint away, exposing the raw metal before you begin drilling.
- **Be sure to look for any wires or fuel lines before you drill.**
- Once connected, the ground wire will connect to the GND terminal on the amplifier.

Remote Turn-On Wire: (Blue Wire) Connection made at factory amplifier

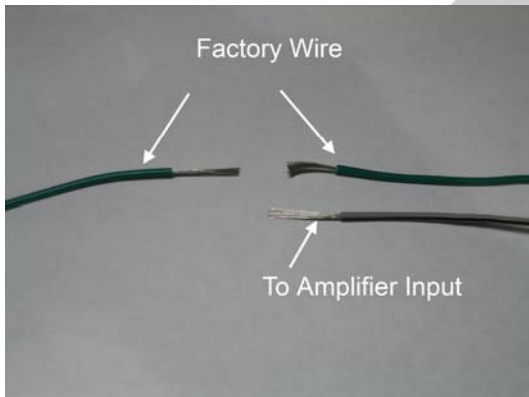
It is important to remember here that we are essentially "T'ing" into the factory wire.

It is important that the factory signal flow be allowed to continue back into the factory amplifier.

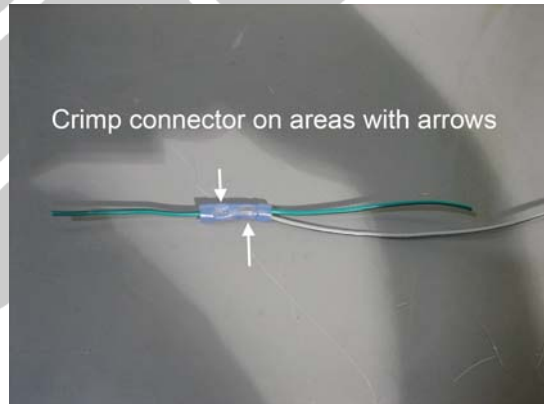
-Locate the **small gauge white wire** going into the factory amplifier in the largest plug on top of the amplifier, closest to the rear of the car. Tap into this wire with the included blue wire and red butt connector. Run this to the REM input terminal of your new amplifier.



Cut the white wire in half approximately 4" off of the plug, so that we can reattach the wires without any issue.



With the factory wire cut in half, twist the wire from the LOC together with one side of the factory wire. Insert these twisted wires into one side of the red butt connector and crimp down tightly, securing the connector.



Using the remaining side of the factory wire, insert the wire into the open side of the butt connector, again crimping tightly to ensure a solid connection.

Getting the music to your new amplifier (Audio Input Connections)

We'll be making our connections at the plug that was disconnected from the factory subwoofers. You'll see 8 wires in this plug. We'll only be using four (4) of them.

1. Find the following two pairs of wires. **Cut the wires in half** approximately 1" off of the plug so we'll be able to make our connections.

Yellow w/Black Stripe (+) and Yellow w/Grey Stripe (-)

Blue w/White Stripe (+) and Blue w/Brown Stripe (-)

- Strip back the insulation on each wire approximately ¼", exposing the copper wire. Insert this into one end of the blue butt connector. Crimp down tightly using a quality crimping tool. Do the same thing on the wires coming off of the LOC, and insert these wires into the remaining end of each butt connector. Follow the guide below.

NOTE – Wire colors can change. If you see any wire with a black, red, or purple stripe, it's positive (+). Solid color wires **other than brown** are also positive.
 -If you see any wire with a brown or grey stripe, it's negative (-). Solid Brown wires **are always** negative.

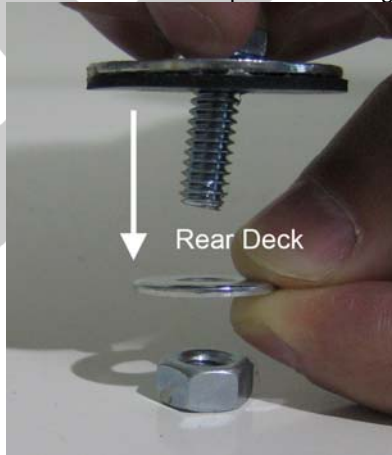
- Now, orient yourself with the Line Level Adapter. There are four individual wires coming out of the unit.

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

Once these connections are made, plug the RCA cables into the LOC and tuck it safely back behind the carpet and out of the way.

Deck Mounted Enclosure Installation:

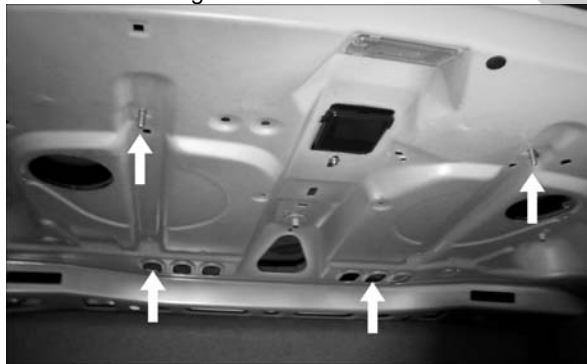
- With the factory subwoofer removed and your wiring completed, you now need to drop the supplied washer/bolt combo down through the small centrally located holes closest toward the trunk opening. Here's the orientation of the bolt as it drops down through the rear deck.



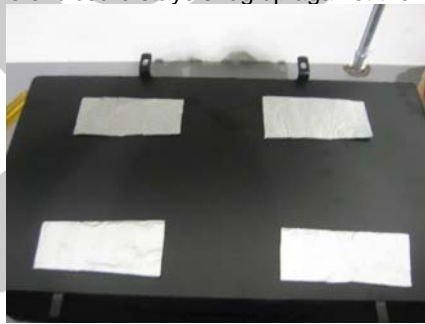
The bolt as it enters the trunk:



Here are the 4 mounting points we'll be using:



2. Next, you'll want to install the sound deadening material on the top side of the enclosure as shown. This just makes sure that the enclosure stays snug up against the rear deck.



3. You'll first slide the enclosure into the rear slots located closest to the back seat. Note the arrows above, and that we aren't using the same slots on either side. We're using the outer slot on the driver's side, and the middle slot on the passenger's side.
4. Now, lift the enclosure upward onto the bolts that were dropped down through the rear deck. Here's where it may help to have a friend around, but it isn't necessary.



Slide the remaining two washer combinations up onto each bolt, and then using a 7/16" socket tighten the nuts down on each side until it's nice and snug. That's it!



When you're completed, it should look like this:



Amplifier Tuning

Testing the Actual Installation Prior to 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: ¼ of a turn, or roughly 9 o'clock.
Crossovers: Set the crossover to LP.
Crossover Frequency: Start at approximately 90hz
2. **Turn the Bass Boost to approximately 9 o'clock, or ¼ turn.**

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 make 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 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.

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.



BAVARIAN SOUNDWERKS

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.