
BMW E46 Subwoofer System by BSW Installation Guide: ib110 for BMW 3 Series, M3 Convertible '00-'06 (E46)

Tools Required:

- Panel Removal Tool
- 7mm and 8mm Socket/Nutdriver
- Torx Driver Set (T30 is required, but a set of Torx drivers would be ideal)
- Crimping Tool
- 10mm Socket Wrench
- Drill
- Brain

Before you Begin

- **Please review and familiarize yourself completely with these instructions before starting work on your vehicle!**
- **Insure that your bass and treble settings are set to their default middle positions before installing your subwoofer.** Once you've installed your subwoofer, you can reset the bass and treble settings to taste. Keep in mind that we generally recommend keeping them both very close to center as large adjustments introduce distortion into the audio signal and will lower performance of your system.

Amplifier Mounting Options:

You'll want to start by first deciding exactly where you want to mount your new amplifier. From there, you'll decide on appropriate paths to run your wiring. **Don't do anything permanently until you have completed the rest of the install!** This step is only so you can plan your install out first! Here are some options:

a. Mount the amplifier to the back wall of the trunk. We typically mount amplifiers on the back wall of the convertibles on the passenger side. You'll only be able to secure the amplifier using the passenger side mounting holes, but the pressure fitment of the amplifier won't allow it to move.



b. Mount the amplifier on top of the spare tire underneath the floor. (This is not an option for M3 owners – see option c below). You'll need to remove and relocate the tool kit attached to your spare tire cover by popping it out off of the tire tray with a panel removal tool. We simply attach the amplifier and tool kit in their new locations using two strips of very strong Velcro for each.



c. M3's have the option of removing the M Mobility kit and mounting the new amplifier in the same location. You'll bend back the aluminum tabs towards the floor, and the amplifier will rest on top of them, while remaining concealed underneath the factory floor panel. Simply screw the amplifier to the trunk floor.

Interior Disassembly

To make the installation as simple as possible, we'll get the car the entire way apart first, and then we'll make our connections. **We only need to remove the Driver side rear side panel.**

1. First look underneath the armrest on the side panel on the driver side of the vehicle. You will see two holes there. Inside are 8mm bolts that secure the panels to the vehicle. Remove these. We have also seen these as Torx T20 bolts.



2. Pull the side moldings from the door jams back, and place your fingers behind the panel containing the speakers. Firmly pull towards you, and the panel will release itself. Now, slide the panel down

and toward the front of the vehicle. Unplug the tweeter.

3. At this point we need to remove the seating area of the backseat to grant better access to the side panel. Simply lift upward and the seat will free itself.



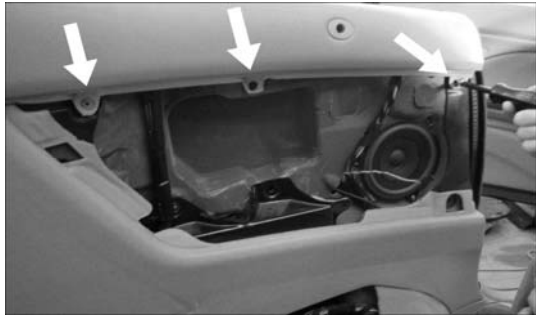
4. Unhook the leather flap that attaches the cushion to the back portion of the backseat and remove the seat bottom.

At this point, we need to remove the back portion of the backseat. It is very easy to remove. The first thing we'll do is lift the headrests all the way up on both sides. You don't need to remove them. After you've done this, look to the bottom of the cushion as it comes to the floorboard. You will see a 10mm nut on either side of the seat cushion securing the panel to the chassis. Remove these. See photos next page.



Side Panel Removal:

1. Now, look back to the area uncovered by the side panels. You will see three 7mm bolts along the bottom edge of the top panel. Remove these. Starting at the rear of the panel, pull outward and down as shown on right.



2. Now pull outward and downward on the front edge, freeing up the top edges of the panel.



3. The panel will come out, revealing the factory amplifier in its housing. **Our wiring connections will be made at the large harness entering the amplifier.** The arrows below show where the 8mm bolts are used to secure the amplifier bracket housing. A large harness going into the side of the amplifier contains all of the connections we'll need. **Unbolt the amplifier and it's housing at this point. We'll need to also unbolt the amplifier from its housing. Remove the 3 brass nuts that secure the amplifier to the bracket.**

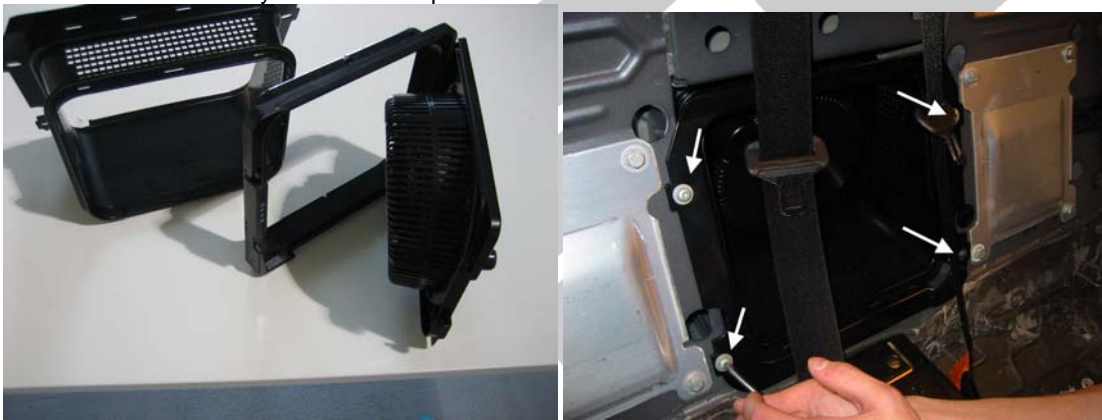
Factory Subwoofer Removal

We also need to remove the factory subwoofer, which is easiest to do from the trunk. If your BMW doesn't have a factory subwoofer, you will likely still need to remove either a ski-pass or a plastic panel. Either way, skip the subwoofer removal portion and simply unbolt whatever is located in the center pass-through.

1. Open the subwoofer door to where the ski pass is completely open. You will see a seam along the bottom floor of the ski pass about 2" in from the trunk.



2. Wedge your fingers (I know, ouch) or panel tools underneath the seam and lift upward and outward towards you.
3. The subwoofer portion of the ski pass will free itself. Unplug the wiring harness from the subwoofer, and tuck it away behind the carpet.

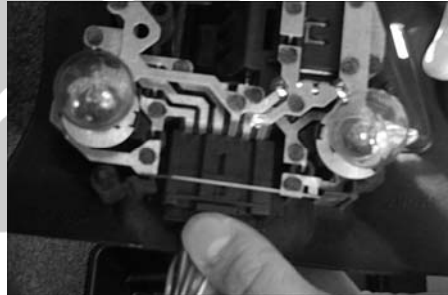


4. The front half of the enclosure can be removed from the inside of the cabin. It is secured using 4 Torx T30 bolts. Remove these and the pathway is now clear for the new enclosure to be installed.
5. At this point you will want to ensure that the foam gasket tape is installed along the outer perimeter of the enclosure where it is going to mate up with the rear firewall.
6. We can now bolt the new enclosure into the car. This couldn't get any easier. Unravel the wire coming from the bottom of the enclosure. Slide it through the small gap underneath the bottom of the ski pass on the passenger side as it enters the trunk.
7. **IMPORTANT: It is imperative that the enclosure seal tightly against the rear wall. The speaker wire CANNOT impede this seal. Make sure that the speaker wire enters the trunk in such a way that doesn't affect this seal.**
8. Now simply bolt the new enclosure into place using the factory hardware. At this point you will want to ensure that the foam gasket tape is installed along the outer perimeter of the enclosure where it is going to mate up with the rear firewall. Make sure that the bolts are VERY secure, and you're ready to begin installing the amplifier at this point. When properly installed and seated, your car should look like the photo on the right.



Trunk Disassembly:

1. Begin by removing all items from the trunk of the vehicle and make sure that all tail lights are in working order. If not, now is a good time to replace them. Also remove the carpet that covers the floor of the trunk, as it will reveal four fasteners that you will need to remove.
2. Remove the tail light covers. Push inward on the clip, and the light will release itself. Now depress the wiring clip attached to the light bulb housing to release the housing, and move the housing safely away from your working space.



3. Now, look to the floor of the trunk. You will see that the two plastic casings on either side of the trunk are secured by plastic fasteners on both the passenger side and drivers' side. Remove the fasteners using your panel removal tool as shown. The plastic screws on the passenger side can be removed using a flat head screwdriver. The battery is located underneath this panel on the passenger side.





With the flooring pieces out, we can now remove the driver side panel as shown below. Carefully pry the carpeted panel out of the trunk. Pull the carpeted panel toward the center of the trunk and downward, freeing it from the convertible mechanism. We will route all wires into the trunk through the pass-through in the photo on the right.



If your BMW has Navigation:

We'll need to safely remove the navigation computer and place it in a safe place. You'll need specific tools to remove the navigation brain, which can be found at most any auto parts store. They are known as "Ford Radio Removal Tools" or simply "Radio Removal Tools".

1. Place the tools into either side of the navigation as shown and then hook your fingers into the tools and pull outward on each of them at the same time.
2. While pulling outward, pull towards the rear of the trunk, sliding the unit out of its housing. Unplug it and carefully place the unit aside.



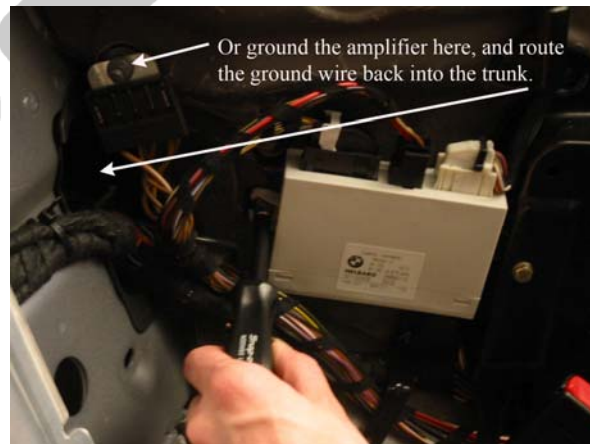
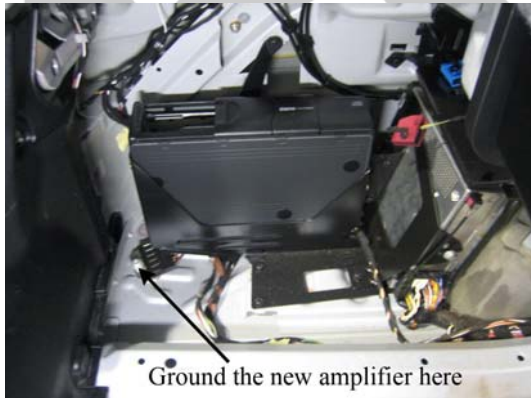
Power, Ground, Remote Turn-On and Audio Input Connections

IMPORTANT: Before you make any connections, disconnect the negative battery terminal from the battery. This will reduce the chance of electrical damage to the vehicle.

Ground Wire (Included Large Gauge Black Wire):

Connect to GND terminal on new amplifier

You can run the large black wire to the **NEGATIVE** terminal of the battery. Alternatively, you can also use any factory ground location in the trunk area where an existing 10mm bolt can be found. These photos show a couple of different factory ground bolts:



Power Wire (Included Red Wire): Connect to B+ terminal on new amplifier

Run the large red wire to the positive terminal of the battery. 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. Connect the other side of the power wire to the **+B** terminal on the amplifier. **ONLY** when both sides of the wire are connected should you install the included fuse into the in-line.

Remote Turn-On Wire (Smaller gauge Blue Wire):

Connect to REM terminal of new amplifier.

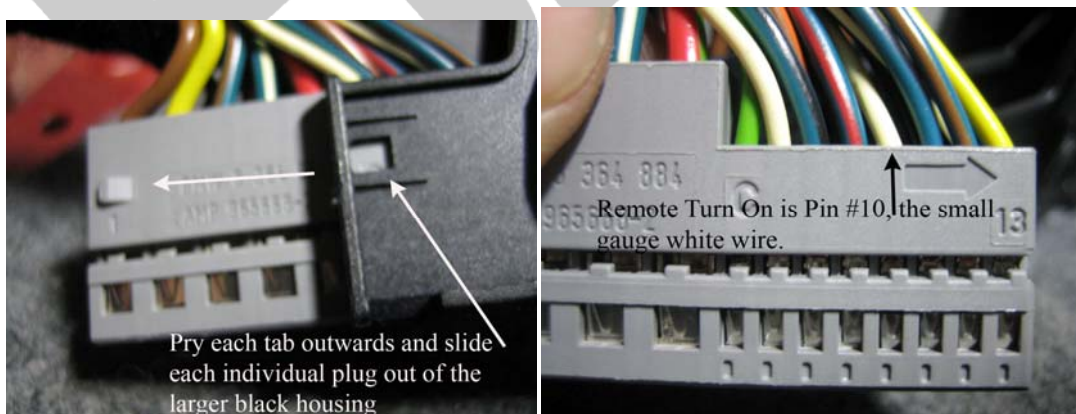
- It is important to remember here that we are essentially “T’ing” into the factory wires. It is important that the factory signal flow be allowed to continue back into the factory amplifier.
- For connection instructions, both written and visual, please see the next section “Audio Input Connections”. Both the remote turn on and audio input connections are made in the same manner.

In the large plug going into the factory amplifier, we’ll need to find the remote turn on wire. You’ll notice a large black housing around the plug, with two separate plugs inside of this black housing.

The wire we’ll be looking for is in the **GREY** plug. It’s a small gauge **White** wire.



Once you’ve identified these two plugs, we need to remove them from the outer black housing. Once removed, the remote turn on wire is in the grey connector, Pin #10.



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

Again, it is important to remember here that we are essentially “T’ing” into the factory wires. It is important that the factory signal flow be allowed to continue back into the factory amplifier.

- You'll need to isolate the following four (4) wires in the factory amplifier harness. They will be twisted together in pairs as they enter the factory amplifier.

- Blue w/Black Stripe (+) twisted with Brown w/Orange Stripe (-)
- Yellow w/Black Stripe (+) twisted with Brown w/Orange Stripe (-)



Now, orient yourself with the **RCA Cables** that you received with your order. There are four individual wires coming out of one of the ends of the cable twisted together in two pairs.

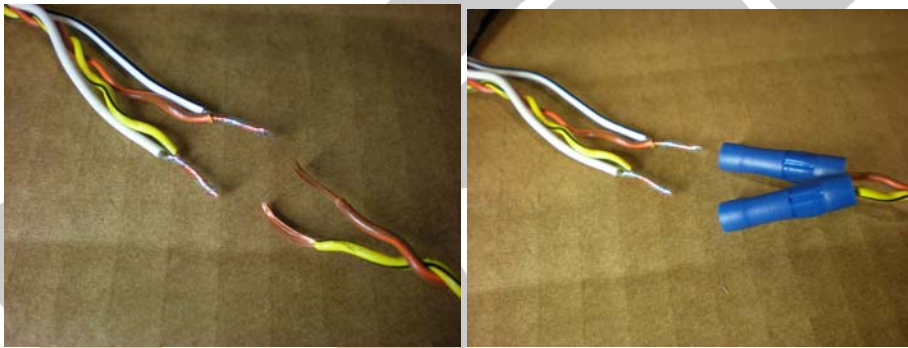


Connect the wires from the RCA Cables to the appropriate wire in the BMW amplifier harness using the included **blue** butt connectors. Left and right here is not relevant, so don't worry about that. The important thing is that you keep the twisted pairs on the RCA Cables aligned.

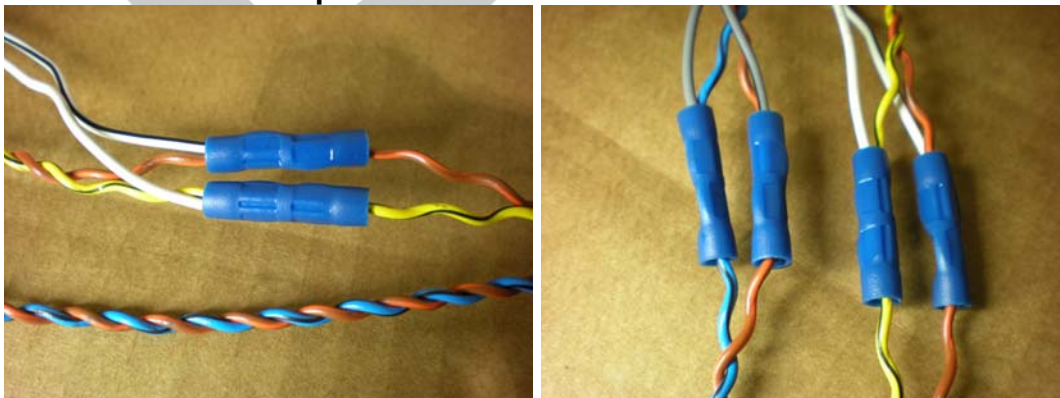
Wire Color on RCA Cables	Wire Color at Factory Amplifier
Red (+)	Blue w/Black Stripe
Grey (-)	Brown w/Orange Stripe
Black (+)	Yellow w/Black Stripe
Grey (-)	Brown w/Orange Stripe

1. After stripping back approximately ¼' of the insulation from the wires, exposing the copper wiring itself, twist one side of the factory wire that you cut in half together with either the included blue remote turn on wire or one of the RCA leads, of course depending on your connection.
2. Insert these two wires into one side of the butt connector, and crimp tightly.
3. Insert the remaining half of the white wire into the unused side of the butt connector and again crimp down tightly.

Visual Representation of Tapping into Factory Wiring:



Here's what the completed connections will look like:



PLEASE NOTE: When making these connections, please keep in mind that the wires at the original BMW harness are twisted in pairs. These pairs **MUST** remain together when making your connections since there may be multiple instances of the same wire color and there would be no way to identify which wire is appropriate for which connection if the wires are separated.

2. **Double-check your connections!** With the variety of wire colors and the number of wires present in this area of the trunk, it's easy to make a mistake. Before going any further, it's absolutely worth your time to insure that you've made the right connections. Go over the connections you've made one more time being sure to verify colors are correctly matched and correct any mistakes, if present.
3. Run the RCA cables and remote turn on wire back through the large hole on the driver's side of the back wall into the trunk and over to the mounting location of the amplifier and plug the RCA cables into the input section of the amplifier. It doesn't matter which RCA plugs into which input, as subwoofer sound isn't stereo. **Connect the remote turn on wire to the "REM" input on the amplifier.**



Connecting the Subwoofer

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. Use the wire with (+) markings for positive, and the wire with (-) markings for negative. We will be bridging the amplifier, so connect the (+) wire to the L+ terminal and the (-) to the R- terminal.

Initial Amplifier Settings

To protect your expensive equipment, we need to make sure your amplifier is set up properly before we turn anything on. (We'll do the tuning a bit later). Here's what to do:

1. **Turn GAIN to ¼ turn (9 o'clock).** To do so, you'll need to use a small flat-head screwdriver and turn the settings all the way left, then back up. Be very gentle; these aren't screws, just

potentiometers, so no force is required.

2. Set the **X-OVER** switch to LP
3. Set **FREQ** setting to approximately 90Hz.
4. Adjust the **Punch EQ** approximately 1/8 of a turn. This can be adjusted extensively to your particular liking. The more you turn the switch clockwise, the more boosted the bass will be around 45hz. See the tuning section for more info.

Testing Connections / Noise

We want to insure that the subwoofer is at least playing at this point, and then we'll proceed to the actual tuning process. Hang in there! The music is coming!

1. Reconnect your negative battery terminal.
2. Start the car, and insure that all interior speakers are playing normally.
3. Head to the back of the vehicle and check that the subwoofer is playing.

If you experience any problems at this point, turn off the car, disconnect the battery terminal, and recheck all your connections. This is almost always the source of any problems. If you need help here, call us! If everything operates as it should, on to the next step!

Let's Add Some Low End (Subwoofer Tuning)

1. At this point go ahead and put the backseat, interior, and most of the trunk back together, leaving your amplifier accessible. You can also permanently mount your amp at this point. This will ensure that the acoustics of the car are correct and that the subwoofer will perform as it was intended to during the tuning process. Here's what you should see:



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

- 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.

IMPORTANT: Shut your trunk after each adjustment when tuning the system. Your subwoofer uses the trunk as its enclosure and will not accurately reproduce music if your trunk is open.

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. 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.

4. Gain Adjustment

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 or interior speakers. 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.

5. Crossover Adjustments:

This setting determines approximately what frequency your subwoofer stops playing. There is a roll-off response above this frequency, but the frequencies are no longer being played full range. The higher the frequency, the higher the notes the subwoofer will play, yielding more midbass (tom drums, higher bass guitar notes, etc.) from your subwoofer. We recommend 90Hz as the sweet spot, but you can adjust up or down by around 30Hz in either direction for your particular taste.

Keep in mind that there is a relationship between gain and crossover settings, and you may need to adjust one or the other down to keep your subwoofer distortion free. **KEEP YOUR EARS OPEN and listen for distortion here.**

6. Punch EQ Adjustments:

This setting can be a bit tricky to get dialed in just right. Essentially, this feature allows a boost of sorts around 45hz. With this subwoofer being of the infinite baffle variety, a boost at this frequency can be a bit "boomy" if you will.... That being said, there is still something to be gained from fine tuning this adjustment to your particular car. We've found the sweet spot to be loosely ¼ of a turn clockwise, but remember, your tastes can vary.

YOU'RE DONE! GO FOR A DRIVE!

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.