



Subwoofer Installation Guide

Tools that you'll need You need some basic tools to mount your subwoofer in an enclosure, and connect it to your system. At a minimum, you should have:

Screws 	Phillips Screwdriver 	Flat Blade Screwdriver 
Utility Knife 	Soldering Iron 	Wire Cutters 
Wire Stripper 	Needle nose pliers 	Saw 
Panel Tool / Retaining clip remover 	Flashlight 	Electrical Tape 
Socket 	Electric Drill + Bits 	Caulk 
Heat Gun (hair dryer) 	Heat shrink tubing 	Wrench 
Wire ties 	Right angle phillips 	Glue Gun 

Basic subwoofer installation

Subwoofers are specialised speakers that reproduce low notes. They're a popular component in many audio systems because they produce deep, strong bass. Also, they help you use your other speakers more efficiently by diverting notes that full-range speakers strain to reproduce.

Subwoofers come in a variety of sizes and shapes. The most common type is an unpowered, component subwoofer. This subwoofer lacks a built-in amplifier as a power source, so you will need to hook it to an external amp to draw current. (Some subs have built-in power supplies – this topic is referenced later in the article). Also, while some subwoofers can be used without a separate box in space-saving free-air installations, most require a strong enclosure to operate properly.

The most basic element of component subwoofer installation is a snap. Mount your component subwoofer to an appropriate enclosure by connecting the leads to the terminal cup, and using mounting screws. It shouldn't take more than a few minutes. You'll then run the wiring to a nearby amplifier. You'll have choices of how you wire your sub. You can wire in parallel for maximum output, or series for a higher-impedance, multiple woofer setup.



You should be able to mount your subwoofer in a ready-made enclosure in just a few minutes.

Ready-made subs

Ready-made subwoofers are a fast, easy way to achieve better bass. The manufacturer already has built the box and installed an appropriate speaker. Some ready-made enclosures have as many as three subs in them. You pick the style and size you like, and match it to your amplifier, your available space, and the rest of your system.

In sedans, ready-made, non-amplified subwoofers usually go in the trunk. If you're feeding it adequate power, the bass it produces will be strong enough to penetrate through the back seat. Just connect the speaker wires from the amplifier and secure the enclosure with straps or brackets. Make sure you don't limit access to your spare tire, or cut through the gas tank or brake line if you drill holes for brackets.



This enclosure from Blaupunkt comes with the sub already mounted.

Powered subwoofers

Powered, or amplified, subs offer an ease-of-use that's handy if you drive a rented or leased vehicle. Because of their portability, these subs can be removed quickly if you sell or exchange your vehicle. They also take up less space than a separate amplifier and subwoofer.

If you're installing a subwoofer that comes with a built-in amp, you won't have to hook up speaker wires, but you will have to install a patch cord (or tap into your speaker leads for the input signal). You'll need an amplifier wiring kit for power, ground and turn-on leads. That usually means you will need to run wire under your seats.

Be extra careful to anchor a subwoofer in a hatchback, station wagon, or sport utility vehicle. It could become airborne and injure someone if you stop suddenly.



The Blaupunkt THB200A is an ultra-small sub that fits under the seat. It's designed for smaller vehicles.

Pre-fabricated sub enclosures

While ready-made subs have many advantages, you will have a greater choice of subs if you choose a component subwoofer and an appropriate enclosure. You choose the subwoofer or subwoofers that suit your musical needs best, and then select the box size that will optimize their sonic properties. You will find that most component subwoofers do not come with any hardware. If the enclosure you purchase does not have hardware either, you might have to provide your own screws. Also, you might need speaker wires and hardware to connect the speaker to the terminal cup in the box. Finally, find some brackets or straps to hold the enclosure in your vehicle.

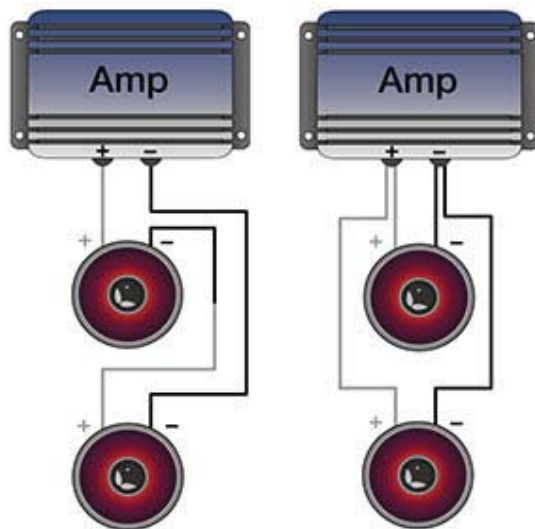


There are a variety of enclosures to accommodate most sizes of subs.

Wiring and break-in

If you go with the most common type of subwoofer installation — a component sub in a box hooked to an amplifier — you will have to consider various wiring possibilities before you start.

A 2-channel amplifier gives you outputs for two speakers. Of course, that doesn't mean you have to connect two subwoofers. You can hook up one, two, or maybe even four. To be safe, you just need to be aware of the impedance of your subs and the "load" capability of your amplifier. These factors will determine which wiring method you should use.



Basic subwoofer wiring

Typically, a car stereo amp "sees" a 4-ohm impedance. When we say an amplifier is stable down to 2 ohms, we're usually referring to the minimum impedance it can handle in stereo (2-channel) mode, not bridged (mono) mode. The lower the impedance (resistance or "load") an amplifier sees, the more power it produces, and the louder your music plays.

A common way to get a 2-ohm stable amp to produce the extra power it delivers at lower impedance is to wire your speakers in parallel. Remember — while series wiring always raises your impedance, parallel wiring always lowers it.

To wire your speakers in parallel, connect the positive (+) leads of both speakers to the amplifier's positive (+) terminal, and the negative (-) leads of both speakers to the amp's negative (-) terminal. You can increase your system's impact dramatically by hooking up two subwoofers (in parallel) to each of your amp's channels.

After you complete the wiring, break in your subwoofer properly. Play the sub at low volume for approximately 20 hours to condition it before you turn up the volume. This will improve the sub's performance and lifespan.

Building your own subwoofer box

An enclosure does more than simply hold the woofer; it is an integral part of the system. A properly sized and built enclosure can turn an inexpensive woofer into a good performer, while a poorly designed or constructed enclosure will make even the finest woofer sound like mud. There are two main challenges in fabricating an enclosure — making sure it contains the proper volume of air, and controlling the cabinet resonances that otherwise will compete with the sound from the woofer and colour its sound.

The ideal volume of an enclosure (length x width x height) will vary depending upon the woofer you select. The enclosure volume for your woofer is usually quoted as internal volume. Therefore, in calculating the overall external dimensions of the box, you must take into account the thickness of the board, the space occupied by the speaker and any internal bracing.

Once you know the internal volume you want to achieve, you'll decide on the dimensions of the enclosure. As a rule of thumb, make sure no internal dimension measures more than three times that of any other. But don't make them too close to each other or you will have a cube — one of the worst acoustic shapes for a speaker.

Finally, determine whether your box will be sealed or ported. A sealed box is the easiest to design and build, and protects the woofer against subsonic bass that can affect its performance. A ported box uses a tube (port) that reinforces the bass produced by the woofer. It can offer excellent, high-output performance, but is more challenging to construct.