Tools Needed: (depending upon vehicle)

- Flat Blade Screwdriver
- Phillips Screwdriver
- Panel Tool
- Utility Knife
- Saw
- Wrench
- Wire Cutters
- Needle Nose Pliers
- Drill & Bit Set
- Soldering Iron
- Socket & Ratchet
- Screws
- Right Angle Phillips
- Glue Gun
- Wire Stripper
- Heat Shrink Tubing
- Electrical Tape
- Heat Gun
- Flashlight
- Caulk
- Wire Ties

**IMPORTANT**

Before starting, compare items on your invoice with items received. Carefully check through packaging material. If any item is missing, please call: Crutchfield Customer Service at 1-800-955-9091

Although reasonable attempts are made to verify the accuracy of the information contained in this guide, it is presented without warranties or guarantees of any type due to the constantly changing nature of this type of information and running changes in vehicle production. Any person or entity using this information does so at his or its own risk. If you find that our instructions do not apply to your vehicle, or if you have questions, do not continue with your installation. Contact our toll-free technical support for assistance (Tech support phone number is on your invoice).

As with any car audio/video installation, your first step is to disconnect the negative terminal of your car battery to prevent short circuits. Check your Crutchfield MasterSheet™ (if available) or vehicle owner’s manual for specific directions. In some vehicles, disconnecting the battery may require you to re-enter a security code or have the dealer reset the internal computer.
Basic Subwoofer Installation

Subwoofers are specialized speakers that reproduce low notes. They’re a popular component in many audio systems because they produce deep, strong bass. Your full-range speakers can operate more efficiently by diverting notes that they would otherwise 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 connect it to an external amp to draw current. (Some subs have built-in power supplies - see page 3). While some subwoofers can be used without a separate box in space-saving, free-air installations, most require a strong enclosure to operate properly.

Most subwoofer installations are straightforward. Mount your component subwoofer to an appropriate enclosure by connecting the leads to the terminal cup with speaker wire, and securing the sub with mounting screws. It shouldn’t take more than a few minutes. Then run the wiring to a nearby amplifier. Choose whether to wire in parallel for maximum output, or series for a higher-impedance, multiple woofer setup (see page 4 for more information).

You should be able to mount your subwoofer in a ready-made enclosure in just a few minutes.
Ready-made & Powered Subs; Pre-fabricated Enclosures

Ready-made Subwoofers

Ready-made subwoofers are a fast, easy way to achieve better bass. The box and speaker are pre-assembled. Some ready-made enclosures have as many as three subs in them. You pick the style and size you like, 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.

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 has a built-in amp, you won’t have to hook up speaker wires, but you will have to install a patch cord to your stereo, or tap into your speaker wires 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, and the power cable to the battery.

Be sure to anchor the subwoofer securely in your vehicle to prevent movement and ensure safety. It could become airborne and injure someone if you stop suddenly.

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. Choose the subwoofer or subwoofers that best suit your musical needs, 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, you might have to provide your own. You may also need to purchase wiring, terminal connection hardware, and mounting brackets.

CAUTION:
Always be careful when drilling or cutting in a vehicle. Be aware of things such as wiring, windows, fuel lines and safety devices. Check drilling/cutting depth and location to avoid damage to vehicle appearance.
If you choose 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, but that doesn’t mean you have to connect two subwoofers. You can hook up one, two, or maybe four. To be safe, just be aware of the impedance of your subs and the “load” capability of your amplifier (check your amplifier’s owner’s manual). These factors will determine which wiring method you should use.

Typically, a car stereo amp runs at 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 output from the woofer and distort 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, 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. Try to avoid building your box in the shape of a cube — it’s one of the worst acoustic shapes for a speaker enclosure.

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.

For more information on building your own subwoofer box, check out “How to Build A Subwoofer Box” at www.crutchfieldadvisor.com.
Tech Tips

- Q-logic boxes come with a Q-Ring. It is designed to level the woofer basket in the speaker opening. When used, screws will pass through the ring and into the wood of the box.