Tools Needed: (depending upon vehicle)

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™ (available for most vehicles) or vehicle owner's manual for specific directions. In some vehicles, disconnecting the battery requires you to re-enter a security code or have the dealer reset the internal computer.

- Flat Blade Screwdriver
- Phillips Screwdriver
- Panel Tool
- Utility Knife
- File
- Allen Wrenches
- Wire Ties
- Needle Nose Pliers
- Drill & Bit Set
- Soldering Iron
- Socket
- Jig Saw
- Wire Stripper
- Shop Rag
- Heat Shrink Tubing
- Electrical Tape
- Heat Gun
- Torx Drivers + Bits
- Wire Cutters
Finding the right location

**Woofers** placement

When installing a component speaker system, you have to decide where to place three separate elements: the woofers, the tweeters, and the crossovers. In many cases, you’ll be able to mount the woofers in the factory speaker locations with little to no changes. This is the “easy fit” option. At most, you will need to drill extra screw holes, cut a small area of metal or pressboard, or file the door panel. “Modify fit” speakers require a greater degree of cutting and drilling. Along with finding the best placement to enhance sound imaging, you must make sure that any changes you make will not interfere with any other mechanisms, and that the speakers will fit securely. Then you can do the actual cutting. Though any speaker, whether “easy” or “modify” fit, can be relocated, it can be complicated and time-consuming process. Common woofer locations are on the dash, in the door, and in the kick panel.

**Tweeter** placement

Installing the tweeters will require some panel modifications, as very few vehicles have existing tweeter mounts. The degree of modification depends on how you mount your tweeters. Just like it sounds, surface-mounting places the entire tweeter on top of a surface. Surface-mounting tweeters requires less modification to your interior than flush-mounting, but will leave you with a more noticeable installation. In a flush-mount, a hole is cut into the door panel that is large enough to accommodate the tweeter, and the speaker is installed level with the interior panel. Whichever you decide, most manufacturers recommend that you mount your tweeters within 12” of the woofers. Otherwise, a sonic wave cancellation, or “phase interference” could occur, caused by the frequencies reaching your ears at different times. Some good places to surface-mount your tweeters are on the door, the sail panel, the kick panel, or the dash.

**Crossover** placement

Placing the crossover usually requires some extra care to make sure that it does not interfere with any moving parts, is secure against vibration, and stays dry. While some like to permanently mount them under the seats or on display, it’s often just as easy to find a convenient spot to stash them behind the mounting panel near the speakers. The closer the crossover is to the speakers, the better, as the proximity will reduce noise. Two good places are in the door and behind the kick panel.

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.
Remember, as with any electronic installation job, disconnect the negative cable on your battery before doing anything else. Also, make sure you have the tools handy that are listed on the first page. Many factory speakers are built into the door, and often your new woofer will easily fit into that factory speaker hole. You may still have to dismantle part of your door to get it in. Here's how:

Removing the door panel
You may have to remove the door panel to get to the factory speaker, or to custom install your speakers. In this case, you will need to start by removing the window crank (if you have one). While some cranks are secured by a screw at the pivot, most are anchored by a spring clip. You can use a window-crank removal tool (available from Crutchfield) or a flathead screwdriver to remove the clip. To do this, depress the door panel until you can see behind the crank, then turn the lever until you see the prongs of the clip, and gently push the crank off with the screwdriver. The clip will pop off, so be careful.

Removing the arm rest and rest of panel
The next step is removing the arm rest. These are usually secured by a few philips-head screws and some trim fittings around the handle. Once the armrest is unattached, the door panel is ready to be removed. For most cars, you will find the panel fastened by a few screws and friction fittings. With the screws removed, you'll want to begin prying off the door panel at the bottom corner. You may use a panel tool (available from Crutchfield), or two putty knives may do the trick. Once the bottom and sides are clear, the panel hangs from some trim that stems from the window well. Simply lift up the trim and the panel should come free.

Removing the old speaker
Carefully lift out the old speaker, as it will be attached to the wiring harness. Some manufacturers also use a sealant foam when mounting the original speakers that you may need to cut through with a utility knife.

SAFETY CHECK
✔ Check that wires do not interfere with window operation.
✔ Test window and door lock operation.
Surface-mounting
You should surface-mount your tweeters if you want to minimize labor time and modifications, or if you don’t have the depth to flush-mount. Surface-mounting may also offer greater angle range than flush-mounting. With a surface-mount, the tweeter is held in place by a cup secured with a screw. You will need to drill a small hole in the panel to secure the mounting cup and run the speaker leads to the tweeter, but that is the only necessary modification (see previous page for instructions on removing the door panel).

Flush-mounting
The advantage of a flush-mount lies in the smooth-looking install, since the tweeter does not protrude out from the panel, leaving a sleek, factory look. Many manufacturers also include angle-mounts that allow you to aim the tweeters slightly, even when mounted within the panel. When flush- or angle-mounting your tweeters, you’ll need to drill or cut a hole in your panel that is large enough to accommodate the entire tweeter.

Installing flush-mount tweeters
First, trace the tweeter cup on the panel or dash. Use a drill with a serrated circular blade to cut the hole. You may want to use a sharp knife to trim the hole. Then, mount the tweeter (your tweeter will have specific instructions for this step).

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.

SAFETY CHECK
✔ Check that wires do not interfere with window operation.
✔ Test window and door lock operation.

Drilling and trimming a flush-mount tweeter hole takes more work, but the end result is less protrusive than a surface-mount.
Crossovers and wiring

Protecting the crossover
It is important to keep the crossover dry. Mounting it in a space behind the plastic door panel is ideal. If you must mount it on the door metal, it’s wise to wrap the crossover in a plastic bag and tape the openings. Another consideration is vibration. Merely placing the crossover in the door or kick panel will cause it to be tossed around. Also, as with the speaker installation, you’ll want to make sure the crossover will not impede or be damaged by any moving parts.

Wiring networks
Component speakers usually have external crossovers, so the wires coming from the receiver must be routed first to the crossover, then to the individual woofers and tweeters. If connecting to an amplifier, the amp should be wired between the receiver and the crossover.

Wiring through existing door boot
If your new component system is in the car door, you’ll need to route speaker wires to the door. Fortunately, most cars have a rubber boot that connects between the door and the car body. Using this boot as a conduit, run your speaker wires out of the door, behind the kick panels, and then to your receiver or external amplifier. An easy way to do this is to tape the wire to a straightened coat hanger and fish it through the interior panels.

Cutting a wire hole
If there is no rubber boot, drill a hole. Before drilling, make sure the hole will have access to the desired speaker location, as structural steel may block it. Protect the wiring from the sharp edges of the hole with a rubber grommet, electrical tape, or some flexible tubing. Once all metal drilling and cutting is complete, vacuum all metal debris to prevent rattling or shorts.

Find a safe place to stow your crossover.

The rubber boot that protects your door wires’ journey to the dash is a great place to house your speaker wires.

How your system should connect: stereo to crossovers, crossovers to speakers.

IMPORTANT
If you’re connecting an amp, make sure you connect it to the stereo first and then to the crossover.

SAFETY CHECK
- Check that wires do not interfere with window operation.
- Test window and door lock operation.
Custom woofer installation

Nothing should stop you from placing your speakers in the location that gives you the best possible sound. If you’re going for an all-out custom installation, you may want to put your woofers in locations that don’t already have speaker openings. In that case, you need to create your own mounting locations. Here’s what you need to know.

Kick panels
Installing your components in a Q-Logic custom kick panel pod allows you to aim and position the speakers for the best possible sound — as close to equidistant from your ears as possible. A kick panel pod also eliminates the need to run wires through your door. Your Q-form comes with detailed installation instructions. If a Q-Form kick panel is available for your vehicle, you can mount both the woofer and tweeter in this custom-fit enclosure.

Creating a custom speaker hole
First, remove the speaker template from the box and make certain that the surface you will be cutting is big enough for the speaker, and that there are no obstructions behind the door panel. For instance, will the window still move freely? Will the door open and swing out without interference? Is the locking mechanism unimpeded? You should double check before cutting a hole.

Top-mount vs. bottom-mount
Once you have determined the location for your custom-mount, decide whether you will top-mount or bottom-mount the speakers. In top-mounting, the lip of the speaker rests over the edge of the hole. This method usually requires less mounting depth and a little less labor. Bottom-mounting means recessing the entire speaker into the hole so that no part protrudes — perfect for creating clean lines. If your system allows you to mount the tweeter on the woofer (and you decide to do so) the tweeter may stick out slightly from the woofer plane. Since you will need to fit the grille over the speaker, make sure the speaker protrusion does not exceed the grille height.

Measure twice, cut once
Take out the speaker template from the speaker’s packing box and place it flush against the mounting surface. Be sure that the hole you will be cutting is big enough for the speaker, and that there are no obstructions behind the door panel. Use the template as a guide to cut your hole. A bottom-mount hole may need to be larger than a top-mount hole. If bottom-mounting, see if a mounting ring is needed and if the instructions suggest cutting a specific hole size.

On cutting metal
If you are creating a new mount in your door, you will need to drill a starter hole for a jigsaw blade. If cutting a small area, you may use a hacksaw instead. When drilling or cutting, always wear eye protection. Do not cut the panel and the metal at the same time; you may rip the panel covering. Wrapping the base of the saw with electrical tape may prevent scratching of the surface metal as well. Keep the blade from touching the car’s exterior panel, as pock marks may appear.
Troubleshooting and system advice

Got noise?
If you’re experiencing a rattle or buzz from your speakers, it may be due to some debris or a loose mount. Remove your speaker, shake it out. Re-secure it, making sure the screws are tight. If you still hear rattling, your speaker might be defective.

Dynamat
For the optimum in noise damping, try a speaker baffle or a Dynamat kit. Dynamat’s noise-reducing technology stifles speaker rattle, engine rumble, road noise, and any other noises that might emanate from the vehicle’s metal environment. Kits are available for door, trunk, speaker, license frame, or bulk matting.

Speaker Distortion
Are your speakers distorting? Check the RMS power ratings given for your speakers, amp, or receiver. They should match, or the amp or receiver should have a lower rating than the speakers (but not too low that they’re distorting due to lack of power). If you have larger speakers or a sub in your car, one option you have for reducing strain on your component speakers is to install a set of Bass Blockers. These filter out low frequencies that the speakers may not be able to handle well.

Out of phase
If your bass sounds weak, you may have attached a set of speaker wires to the wrong set of terminals. Simply reverse the leads on one set of terminals on the weak speaker. As long as you’re consistent, it does not matter which terminal you designate positive or negative.

Environmental damage
A vehicle is subject to all weather conditions, and that means your speakers are, too. Moisture is a common cause of speaker damage. Use a set of speaker baffles (soft foam surrounds) to keep out moisture and protect the speaker against dust and filaments. Even if your speakers aren’t showing signs of weather damage, speaker baffles are a great idea since they tend to reinforce bass response.

Shorting out
Baffles will also help if your speakers are shorting out. Mounting your speakers close to metal could result in inadvertent contact between the speaker and the metal, causing a short. Speaker baffles create a barrier between the speaker and the metal. Another solution is to wrap the speaker terminals with electrical tape.

Speaker baffles help minimize damage to a speaker resulting from dust or moisture.
Tech Tips

- Avoid mounting crossovers with exposed screw terminals in the door.

- Do not pry off the factory grill. Consult the Crutchfield Master Sheet. Most factory grills do not pry off.

- Check polarity on select crossover boxes. Ensure that the tweeter and woofer are connected to correct outputs on the crossover box.

- Most aftermarket tweeters will not fit in the factory location without modification. Check the recommended mounting methods supplied with the speaker instructions.