



Installing Car Speakers

Car stereo sound can be greatly improved just by substituting new speakers

Probably the greatest improvement you can make on a cost/performance basis in an automobile stereo sound system is to replace the speakers that originally came with it. Better-performing ones can smooth out the sound while extending high and low frequencies.

The installation photos shown here and accompanying captions illustrate how to make these changes with as little pain as possible. If the replacement speakers are not identical with the original, which is often the case, then there is little extra work to be done in order to fit the speakers into their appropriate setting. With a bit of imagination, you will also have guidelines to adding new speakers in new locations.

Car Stereo Overview

A car stereo system might be considered akin to a home stereo component system. Separate components, such as speakers, can be added to the basic unit. To add more power than is possible with a basic radio or combination radio/cassette unit, a power amplifier can be added. If you go this route, though, be sure that your speakers have the power-handling capacity needed to avoid blowing them out.

In addition to a power amplifier

booster, car sound aficionados often add an equalizer as well, which is an even more important accessory in an automobile than it is in a home. Power amps and equalizers are often combined in one package, though they are also available separately. Going the fully separate components route, speaker outputs from a car radio would go directly to an equalizer, which would output to a power amplifier, then to frequency dividers and, finally, to separate speakers.

Car radios and allied equipment draw their power from the automobile's electrical system, of course. Usually, the power cable has a quick-disconnect with a fuse that goes to the ignition switch.

As you know, there is not much space to toy with in a car. Consequently, installing speakers or a radio presents a greater mechanical challenge than they do in a home. Raw speakers are commonly used in automobiles, where the door or trunk is utilized as the enclosure. A small percentage of speakers designed for cars do come in enclosures, however. Mostly, though, they are useful only in vans where space is not at such a premium.

Keep in mind that the proper impedance matches for speakers to their inputs should be maintained.

Front and rear speakers are usually paralleled, while speakers in each area are most often in series. Consequently two 4-ohm front speakers from a single channel would commonly be in series, totaling 8 ohms; the same goes for two rear speakers. The combined speakers, front and rear, would therefore have an impedance of 4 ohms, since each setup is in parallel with each other.

If you are adding speakers in a new location, be sure to use stranded wire and follow color codes. To run the wiring in a new installation, you will probably have to remove door sills and locate the wiring under the edge of a car's carpeting, concealing the wiring behind side kick panels and under the dashboard. For an existing installation, where only the speakers are being substituted, the wiring is already installed, so this presents no problems.

Do not rush out and buy new speakers because you would like to upgrade the sound of your system with them. First check the original speakers and determine their dimensions. Then try to buy upgraded ones with the same size. This will save you a lot of frustrating time and effort.

Photographs and captions by Ron Cogan

—Step-By-Step Speaker Installation—



1. Begin your car-speaker upgrading by checking the factory-installed speakers' dimensions and then try to purchase upgrade ones offering the same size.



2. Even if you do purchase identically sized speakers, it is likely that their metal frames will differ slightly. This metal may have to be trimmed so the new speaker will fit properly. To do this, place old and new speaker face down as shown and scribe around the original so trim marks are visible.



3. Carefully use tin snips along the marked outline to trim a new speaker's frame to size. Trimming in this way does not affect the speaker's sound, but voids a speaker's warranty nonetheless, of course.



4. A trimmed speaker now fits precisely into the factory location that housed the original 4" x 6" speaker in this car. It bolts into the housing easily with the original hardware, too.



5. Often, factory quick-disconnects found in speaker wiring will not mate correctly with the new speakers. To remedy this, simply snip off the original connectors. Then crimp insulated connectors onto the stripped wire ends to join the vehicle's speaker wires to the new speakers.



6. The speaker housing and grille are now fitted back into place on the door panel and bolted tightly down. No apparent change has been made from an aesthetic point of view, but much cleaner, extended-frequency sounds will soon emanate from behind the grille.

Speaker Installation continued . . .



7. A similar procedure can be followed to update rear speakers in any car with factory speaker locations here. In this case, the window cranks had to be removed and the rear side panels snapped from position, as shown. Once all fasteners have been snapped outward and away from the interior body metal, the panel was simply moved aside to reveal the factory's speaker location. A near-invisible grille is built into the factory panel here.



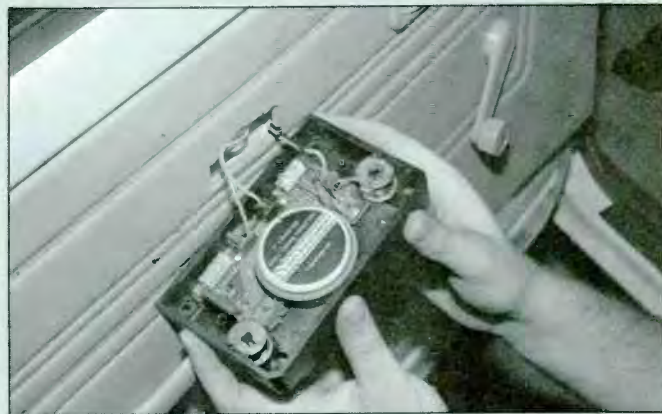
8. Unbolt the factory speaker and pull it from its mounting location. Again, note the type of connectors used to join the factory speaker wiring to the terminals. Reuse them if possible; otherwise, snip them off and install new crimp-on connectors.



10. Connect speaker terminals to the vehicle's speaker wires, align the speaker, and then bolt it into position. You can see why new holes were needed here. All that remains is to snap the panel back into place.



9. Following the procedure outlined earlier, trim the new speaker to size if needed. Here, a Kenwood KFC-1205 5" round speaker did not require trimming but did require some new mounting holes to be drilled.



11. Surface-mount speakers, like this Kenwood tweeter, can also be used. They require only a small access hole for speaker wiring. Surface-mount speakers are simple to install because very little is involved.



12. Once the hole is cut and speaker wiring is routed and connected, the speaker is simply aligned on the panel and installed with screws. Since surface-mount speakers are bulkier than flush-mounts, they may not always be effective in small cars.



13. Installing speakers in a nonfactory location like door panels is a bit more involved but fairly easy. Begin by pulling the panel off the door and making sure there is enough clearance. Then align the template.



14. After making cut lines with the aid of the template, cut the panel to make an access hole for the speaker. Metal tabs can be installed at bolt locations to accommodate self-tapping screws if needed.



15. If speakers are installed in nonfactory locations, you will have to route new speaker wiring from here to your amplifier or deck. Use insulated connectors to make these connections.



16. In the event you want to add new speakers and additional power, you can even do it with a single component. Several autosound companies market bi-amplified speakers that boost the wattage output of a stereo system right at the speakers. For example, the Sparkomatic unit shown (Model ASK3010) offers 50 watts of output power (40 watts each woofer and 16 watts each tweeter). It is designed for rear deck mounting.

Car-Audio Installation Tape

A videocassette training tape, "Basic Car Audio Installation," is available from EIA's Consumer Electronics Group. This 30-minute videotape introduces the electronics technician to car audio installation, guiding an installer in the correct layout and design of a car-stereo installation facility. It covers

basic as well as specialized tools needed for the installation, and outlines the correct procedure for removing and replacing car radios from the dashboard.

Among other key topics covered in this training tape are safety in the shop; how to treat the customer's car, from pre-installation checkout to demonstrating the completed job; the technical resources available for information

about specific types of vehicles, dashboard dismantling, speaker sizes and antenna locations; and types of speaker wiring found in the automobile.

For additional information on this videocassette, which is priced at \$30, contact the CEG Product Services Dept., Electronic Industries Association, 2001 Eye St. N.W., Washington, DC 20006 (Tel.: 202-457-8782). **ME**