



BASIC ADVICES FOR CAR SOUND BUILDERS

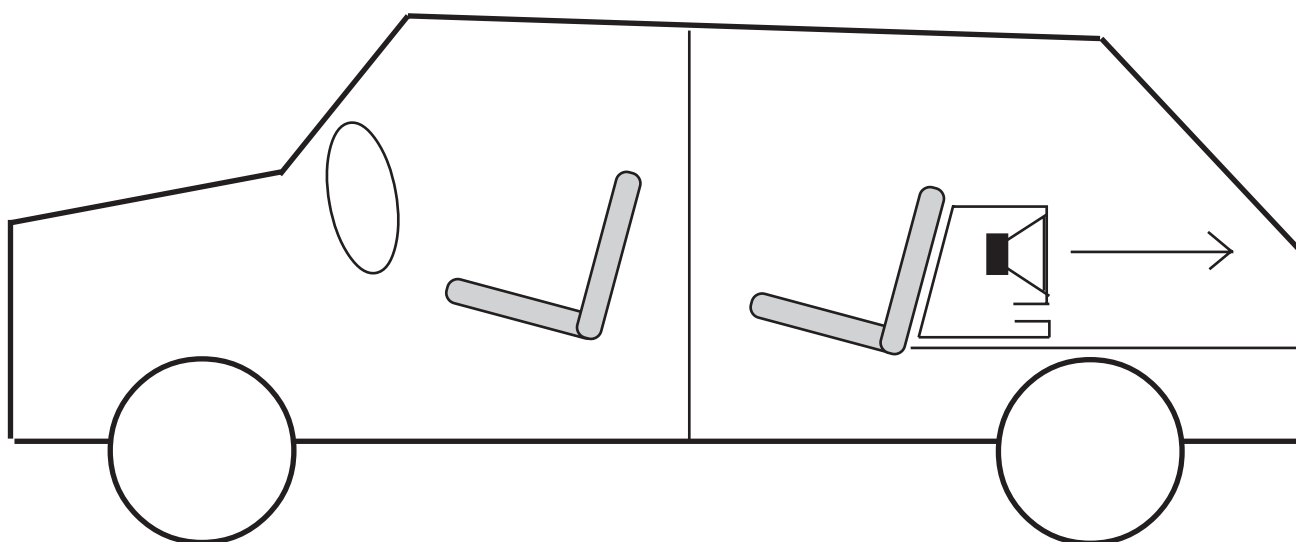
On the following 10 pages there are some basic advices for car sound builders. If you want further information about how to do a high quality sound installation we suggest that you download the DLS Sound Handbook in PDF-format from the DLS SUPPORT pages on our WEB-site.

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BASS BOX MOUNTING IN CARS

1. SMALL CARS LIKE VW GOLF, OPEL KADETT AND SIMILAR.

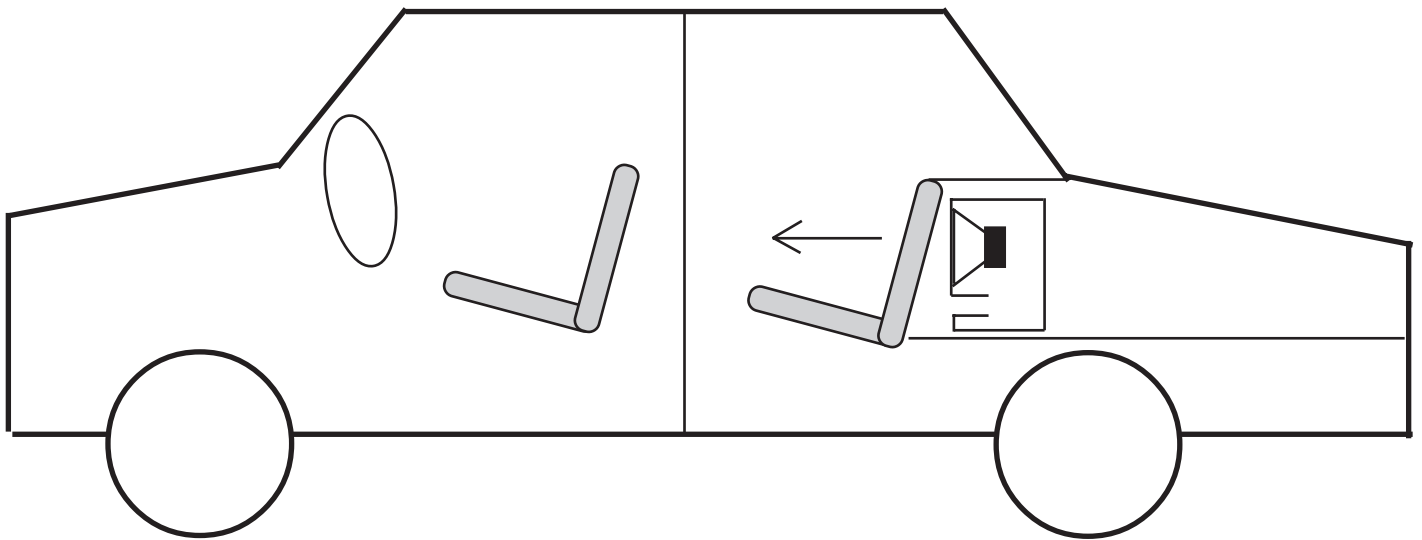


IN THIS TYPE OF CARS THE BASS BOX SHOULD BE MOUNTED WITH BOTH THE SPEAKER AND PORT DIRECTED BACKWARDS.

ALTERNATIVELY YOU CAN DIRECT BOTH SPEAKER AND PORT UPWARDS.

BASS BOX MOUNTING IN CARS

2. SEDAN CARS LIKE VOLVO 240/740/940 AND SIMILAR.



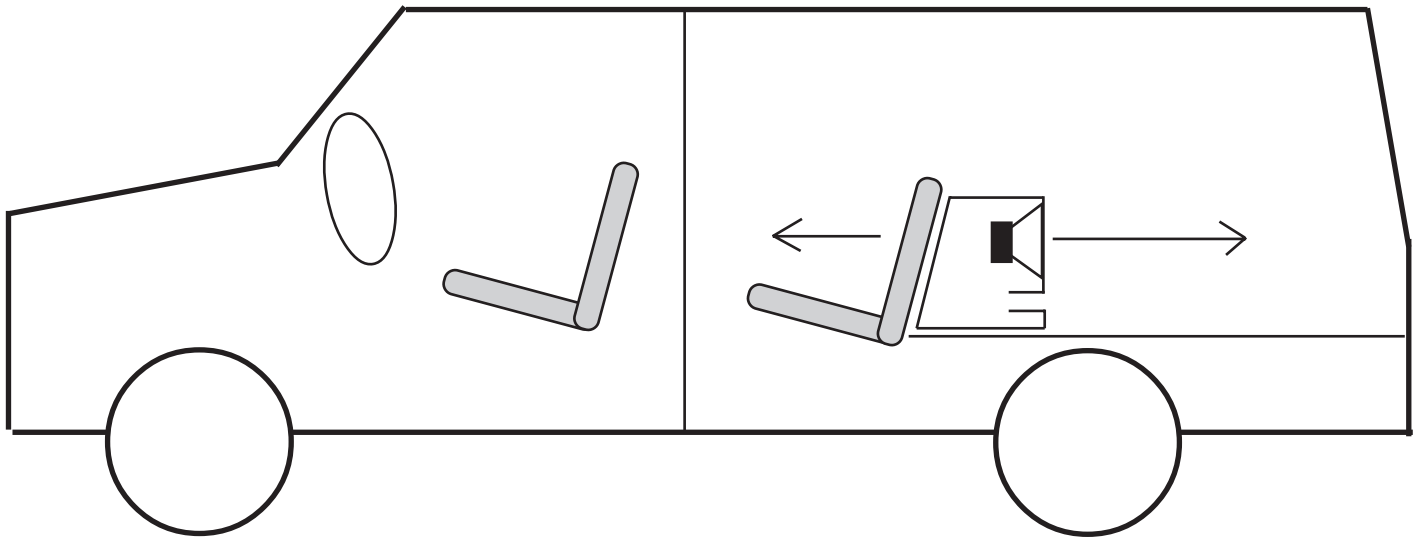
IN THIS TYPE OF CARS THE BASS BOX SHOULD BE MOUNTED WITH BOTH SPEAKER AND PORT DIRECTED FORWARDS.

LEAVE A FREE SPACE IN FRONT OF THE PORT. SEALED BOXES CAN BE PLACED CLOSE TO THE REAR SEAT.

ALTERNATIVELY DIRECT BOTH SPEAKER AND PORT UP THROUGH THE HAT-RACK WITH A BOX UNDER IT.

BASS BOX MOUNTING IN CARS

3. STATION WAGONS LIKE VOLVO 245 745 AND SIMILAR.

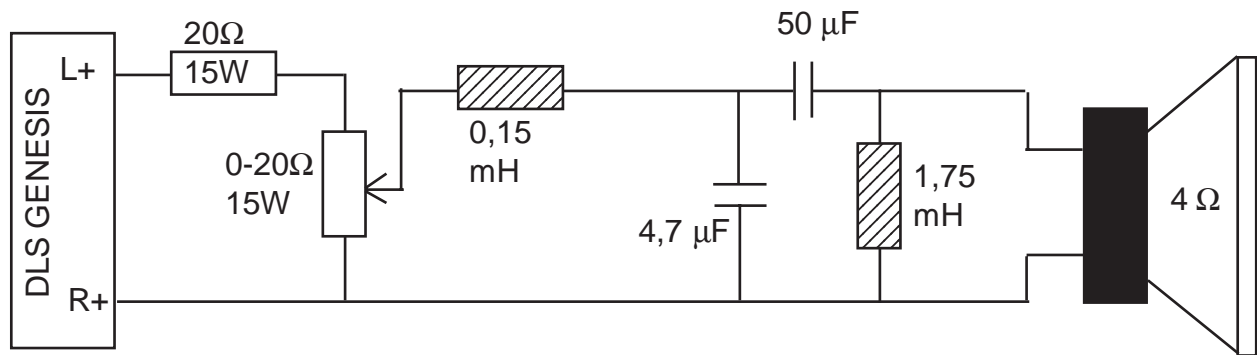


IN THIS TYPE OF CARS
THE BEST SOUND IS ACHIEVED
WITH THE BASS BOX MOUNTED BEHIND
THE REAR SEAT WITH BOTH SPEAKER
AND PORT DIRECTED BACKWARDS.

CENTER-CHANNEL SPEAKERS

THE USE OF CENTER-CHANNEL SPEAKERS IS A WAY TO IMPROVE THE SOUND IMAGE IN INSTALLATIONS WHERE THE SPEAKER MOUNTING MAKES IT DIFFICULT TO ACHIEVE A GOOD SOUND.

TO BE CONNECTED IN BRIDGE MODE AND MOUNTED ON THE DASHBOARD.



THE LEVEL IS ADJUSTED WITH THE VARIABLE RESISTOR
FREQUENCY RESPONSE: 550 Hz - 6000 Hz.

REAR FILL SPEAKERS

SOMETIMES WE MOUNT ONE OR TWO SPEAKERS IN THE BACK AS "REAR FILL". THIS WILL IMPROVE THE FRONT IMAGE BY ADDING A WEAK SOUND FROM THE REAR FILLING UP THE FRONT SOUND AND GIVING IT A DEEP.

THE FREQUENCY RESPONSE SHOULD BE LIMITED, ABOUT 500 - 6000 Hz.

THE SOUND LEVEL SHOULD ALSO BE DAMPENED.

REAR FILL SPEAKERS CAN BE CONNECTED IN THE SAME WAY AS CENTER CHANNEL SPEAKERS

FRONT SYSTEM MOUNTING

ORIGINAL MOUNTING

ADVANTAGES:

- FAST, EASY AND SIMPLE

DISADVANTAGES:

- THE SPEAKERS HAVE NO BAFFLE
- BAD POWER HANDLING CAPACITY
- BAD SOUND IMAGE
- NO BOX FOR THE ELEMENT

MOUNTING IN NEW "DOOR BAFFLES"

ADVANTAGES:

- THE SPEAKERS ARE MOUNTED IN REAL BAFFLES
- A BOX CONSTRUCTION THAT IMPROVES THE SOUND
- HIGHER POWER HANDLING CAPACITY
- IMPROVED SOUND IMAGE

DISADVANTAGES:

- MORE MOUNTING WORK
- THE CARS ORIGINAL DOOR SIDES ARE AFFECTED
- REQUIRES A LOT OF KNOWLEDGE TO CREATE A PROFESSIONAL INSTALLATION.



FRONT SYSTEM MOUNTING

MOUNTING IN KICK-PANELS

KICKPANELS ARE NORMALLY MOUNTED DOWN ON THE FLOOR DIRECTED UPWARDS / INWARDS.

ADVANTAGES:

- STABLE MOUNTING
- LESS AFFECTION ON THE CARS INTERIOR
- HIGHER POWER HANDLING CAPACITY
- SUPERB SOUND IMAGE

DISADVANTAGES:

- MORE MOUNTING WORK
- A RISK FOR DAMAGING THE SPEAKERS WITH THE FEETS.



HIGH MOUNTED KICK-PANELES

IN SOME CARS THE KICK-PANEL CAN BE MOUNTED INVISIBLE UP UNDER THE DASHBOARD.

CAN CREATE A GOOD SOUND IMAGE DESPITE THE STRANGE WAY OF MOUNTING THE SPEAKERS.

TROUBLE SHOOTING GUIDE

Installing car sound can sometimes cause problems. If you are not satisfied with the sound you could have made something wrong.

Some typical problems are described below with hints for solving them.

1. Problem: Poor bass reproduction despite a correct designed bass box.

- Start with phase reversing the subwoofer to see if this helps.
- If you are using more than one subwoofer make sure they are connected in the same phase (polarity), if not most bass sound disappears. (The speaker cones are moving but will not create any bass sound).
- If the bass reproduction is improved when opening the doors of your car the box is too large, The F-3dB point is too low. Make the box smaller.
- Standing waves can "kill" some frequencies. Try to change place for the box. You can also try to make the bass port shorter, this will increase the box resonant frequency.

In some cases the area under the dashboard can work as a wave trap killing some low frequencies.

Try to fill this area and tighten it.

TROUBLE SHOOTING GUIDE

2. Problem: The real "kick" lacks in the bass sound.

- The box is not correctly build, or the box is not air tight.
- The sub amplifier does not get enough power, the power cables are too small, the ground connection bad, or some other things that is causing voltage drop at high power outputs.

A cheap amplifier with insufficient capacity in the DC-converter can give the same result.

A good car battery with low inner resistance (OPTIMA) or a Power Cap of 0,5 Farad or more connected to the power lead will also improve the bass reproduction.

3. Problem: "Rumble" bass sound.

- The box tuning is too low, make the F-3dB higher with a smaller box.
- Connect a subsonic high-pass filter, 30 - 50 Hz, in series with the amplifier input.
- Use vented or sealed boxes. Avoid band-pass boxes, they are more difficult to build, and if they are incorrectly designed they create a rumble bass sound.

TROUBLE SHOOTING GUIDE

4. Problem: Poor bass reproduction in a system without separate subwoofer.

- Is normally caused by incorrect speaker phasing. Make sure all woofer elements in the system are connected with the same polarity (phasing). Both front and rear speakers.

This is easiest made with the use of a 1,5 Volt battery. Connect the battery + to the speaker + cable, and the - to the speaker - cable. All speaker cones must move outwards when the battery is connected.

5. Problem: Interference sound from the alternator in systems with a separate amplifier.

- Is normally caused by incorrect grounding. Try to connect all units to the same ground point. It should be a place close to the amplifier where the paint is removed from the metal surface.
- Poor shielding on the signal cables, or a defective cable.
- The signal cable is placed close to the cars own cable wiring inducing interference into the signal cable.
- Any extra cable must not be laid in a ring, shorten the cable or lay it in zig-zag instead.