



Precision Engineered Subwoofer

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- ARC 15D2
- ARC 15D4
- ARC 12D2
- ARC 12D4
- ARC 10D2
- ARC 10D4
- ARC 8D2
- ARC 8D4



ARC Audio 4719 Greenleaf Cir #4 Modesto CA 95356 Phone:209-543-8706

SPEAKER SPECIFICATIONS

| | 8D2 | 8D4 | 10D2 | 10D4 | 12D2 | 12D4 | 15D2 | 15D4 | |
|-------------------|---------|----------|----------|----------|----------|----------|---------|---------|---------------------------|
| IMP | 1 or 4 | 2 or 8 | 1 or 4 | 2 or 8 | 1 or 4 | 2 or 8 | 1 or 4 | 2 or 8 | Impedance |
| Re | .95/3.8 | 1.95/7.8 | .925/3.7 | 1.95/3.9 | .975/3.9 | 1.75/7.0 | .90/3.6 | 1.8/7.2 | DC Resistance |
| Fs | 22.7Hz | 24.7Hz | 24.5Hz | 25Hz | 21Hz | 22Hz | 20.4Hz | 20.5Hz | Resonant Frequency |
| Qes | .317 | .367 | .357 | .365 | .298 | .317 | .443 | .431 | Electrical "Q" |
| Qms | 3.331 | 3.572 | 4.56 | 5.12 | 4.29 | 4.35 | 2.462 | 2.762 | Mechanical "Q" |
| Qts | .289 | .332 | .331 | .341 | .278 | .317 | .375 | .373 | Total "Q" |
| Vas (cuft) | 1.7 | 1.55 | 2.0 | 2.25 | 4.76 | 4.41 | 9.99 | 9.88 | Equivalent Volume |
| Xmax (mm) | 15mm | 15mm | 15mm | 15mm | 16mm | 16mm | 18mm | 18mm | One way Linear |
| Sd (cm2) | 231 cm2 | 231 cm2 | 350 cm2 | 350 cm2 | 530 cm2 | 530 cm2 | 840 cm2 | 840 cm2 | Cone Area |
| SPL (dB) | 85.4dB | 85.6dB | 87dB | 87dB | 89.dB | 89dB | 89.dB | 89dB | 1 watt @ 1 meter |
| RMS Power | 150 W | 150 W | 250 W | 250 W | 350 W | 350 W | 750 W | 750 W | Continuous |
| MAX Power | 300 W | 300 W | 500 W | 500 W | 700 W | 700 W | 1500 W | 1500 W | Music |

ENCLOSURE RECOMMENDATIONS

| | 8D2 | 8D4 | 10D2 | 10D4 | 12D2 | 12D4 | 15D2 | 15D4 |
|-----------------------------|------------|------------|------------|------------|------------|------------|------------|------------|
| SEALED ENCLOSURES | | | | | | | | |
| Optimum Sealed | .35cuft | .35cuft | .65cuft | .65cuft | .90cuft | .90cuft | 2.25cuft | 2.25cuft |
| Small Sealed | .2cuft | .2cuft | .5cuft | .5cuft | .65cuft | .65cuft | 1.5cuft | 1.5cuft |
| PORTED ENCLOSURES | | | | | | | | |
| Volume | .6cuft | .6cuft | .9cuft | .9cuft | 1.30cuft | 1.30cuft | 3.0cuft | 3.0cuft |
| Port Frequency | 34Hz | 34Hz | 32Hz | 32Hz | 30Hz | 30Hz | 32Hz | 32Hz |
| Port Quantity | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 |
| Port Area and Length | 2"d X 12"L | 2"d X 12"L | 3"d X 15"L | 3"d X 15"L | 3"d X 12"L | 3"d X 12"L | 4"d X 18"L | 4"d X 18"L |
| PHYSICAL DIMENSIONS | | | | | | | | |
| Displacement | .04cuft | .04cuft | .05cuft | .05cuft | .07cuft | .07cuft | .17cuft | .17cuft |
| Cutout Diameter | 7.125" | 7.125" | 9.25" | 9.25" | 11.125" | 11.125" | 11.125" | 11.125" |
| Mounting Depth | 4.75" | 4.75" | 5.5" | 5.5" | 6.0" | 6.0" | 8.0" | 8.0" |

Useful Information

Ultimately the enclosure you build determines the performance of your subwoofer. The size and vent tuning frequency, if you're using a ported box, determine the low-frequency extension and output of the subwoofer. We have designed the ARC Audio subwoofer to perform well when used in both sealed and ported enclosures.

The acoustics of your vehicle also influence bass response. The small interior size of most cars and trucks boosts low frequencies dramatically. You will need to use a smaller enclosure than normal to achieve a flat bass response. As a rule, below 50Hz (depending on cabin size), bass response increases at about 12dB per octave as the frequency decreases. This "Cabin Gain" adds significant bass output to the subwoofer system.

We have given you two enclosure recommendations that are listed on the previous page. One sealed and one ported. The sealed enclosure design will, in most cases, give you the best sound quality and take up less space in your vehicle. The ported box design will offer more output than the sealed enclosure (about 3 - 4 dB more), but it will reduce the power handling and require more space to install. The recommended ported enclosure is not designed for "competition SPL" performance, it is designed for normal listening. It will increase the low frequencies output and increase the overall volume while still sounding good when properly tuned and installed.

A Note About Power Handling

ARC Audio woofers are designed to perform for years without any problems. The RMS power noted under the specifications is the recommended continuous power for long term use. All woofers make heat. It is possible to dissipate only so much of this heat. The woofer can handle as much as twice its rated RMS power for short periods. This is the MAX power rating. Continued use of this woofer at greater than the RMS power rating will result in a damaged (burnt) voice coil. This damage is considered abuse and is NOT covered under the warranty.

Small Amp Myth

Under powering a woofer is fine. This woofer will suffer no damage from a 100 watt amp if it is correctly tuned. However, even a small amp that is being over driven (clipped) can destroy a sub. Use your power wisely. Clipping can be heard as a dull thud or a popping sound. If you hear any change in the tone of your subwoofer this is a danger sign. TURN IT DOWN. If you want more volume get a bigger amp or add another woofer.

Physics

"Energy cannot be created or destroyed, only change forms". What does this mean? Your amp does not make power, it takes power from your battery and converts it into a different form. The subwoofer is just another kind of converter. It changes AC voltage from the amp into changes in air pressure (that's all sound is) and HEAT. The more energy being converted the more heat. A speaker can not reproduce DC voltage (produced when an amp clips) but this energy must go somewhere. It is all converted into heat. This is why clipping is so dangerous to a speaker.

A great deal of energy can also be lost in the enclosure. If your box is not strong enough the sides will flex. It takes energy to flex the box. This energy is not being converted into sound. In short, the stronger the box the less energy will be lost. So build it Strong.

This same thing can happen to the car body. Sound deaden, it will sound better and hit harder.

Building an Enclosure

It is recommended that you use 3/4" MDF (Medium Density Fiberboard) to build an enclosure. Glue all your joints with yellow glue and secure them with screws or nails.

Make sure the enclosure will fit and that you have adequate room to get it in and out of the vehicle.

Calculating Enclosure Volume

It is difficult to give exact box dimensions that are universal for all cars and trucks. It is for this reason that you must be able to calculate the space in which you have available in order to achieve the proper air volume required.

Calculating External Volume

1) To calculate box volume, measure the outside Width x Height x Depth of the enclosure.

Example 12" x 14" x 9" = 1512 cubic inches.

2) Next you must convert cubic inches into cubic feet. To do this, you must divide the cubic inch total by 1728 .

Example 1512 cu in / 1728 = .875 Cubic feet.

Calculating Internal Volume

1) To calculate the internal (net) volume of the above box you must first multiply the thickness of the wood you are using by Two (2).

Example: 3/4" x 2 = 1 1/2"

2) Next subtract 1.5" from each of the outside measurements of the box. Width 12" - 1.5" = 10.5" . Height 14" - 1.5" = 12.5" . Depth 9" - 1.5" = 7.5"

3) Multiply the new totals (H x W x D)

Example: 10.5" x 12.5" x 7.5" = 984.375 cubic inches.

4) Next you must convert cubic inches into cubic feet. To do this, you must divide the cubic inch total by 1728.

Example 984.375 / 1728 = .5696 cubic feet.

For additional information call ARC Audio Tech support at:

209-543-8706

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