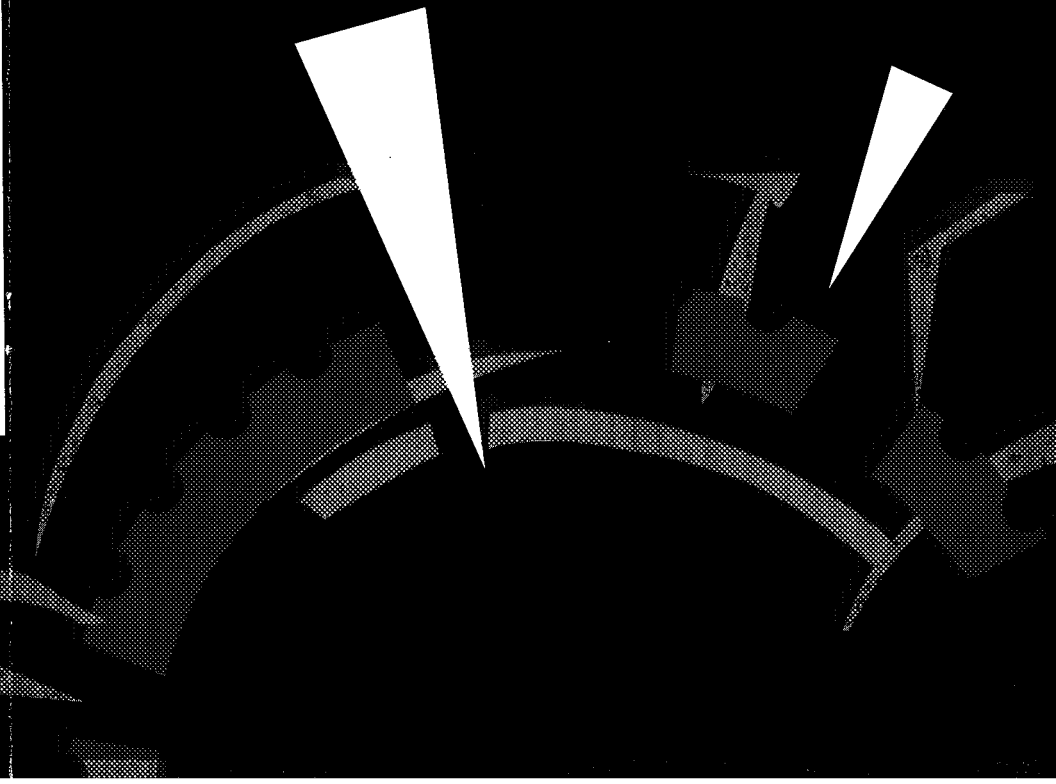
GTX SUBWOOFER SERIES OWNER'S MANUAL

GTX



Introduction

Thank you for purchasing one of the finest automotive subwoofers that JBL has ever produced. By following these installation and use instructions, you will enjoy years of trouble-free performance. Be sure to send in the customer information card, which you will find attached to your warranty. This will help us better understand the future product needs of you, our valued customer. We suggest you fill the card out at your earliest convenience. Also, be sure to save your sales receipt in a safe place. It will be necessary to use it as proof of purchase in the event that you ever need warranty service.

Because this is a high performance subwoofer and it may be installed in many different installation configurations, to unleash its full performance potential we strongly recommend that you have the subwoofer professionally installed. When installed by an authorized JBL dealer in the USA we will double the length of your warranty to two years. If you feel you have the skills necessary to properly build an enclosure and install the subwoofer yourself, the instructions and charts in this manual will provide you with all the necessary information.

Autosound at its Best

The GTX Subwoofer is built to meet the same rigorous standards of construction and performance that have long established JBL's renowned home and professional speaker systems. The GTX Subwoofer achieves its exceptional performance with leading edge technologies that push the performance envelope in automotive sound.

The exceptional sound of the GTX Subwoofer comes from a mineral-filled polypropylene cone coupled with a butyl rubber surround for extra cone stiffness combined with high suspension compliance and resonance elimination. The cone motion is controlled by a synthetic rip-stop suspension which resists tearing for safe, effortless, high-power use. The cone is driven by a dual stacked-magnet motor structure utilizing a 2" multi-layer voice coil wound on high temperature Fiberglass former. This motor structure features JBL's extended pole piece design to create a uniform and symmetrical magnetic flux field through the coil and thus lower distortion. The frame and cone are contained in a high strength die-cast aluminum frame for maximum rigidity, and more magnetic power concentrated on the coil.

These carefully selected materials used in a conscientiously engineered design results in a driver with smooth frequency response, excellent transient response, high output efficiency, and high power handling in a rugged package able to deal with the rigors of high performance audio. The result is exceptionally powerful, dynamic and accurate sound reproduction that cuts through the road noise and provides a solid musical foundation.

Enclosure Education

The enclosure you use to mount your subwoofer plays a profound role in the performance of your subwoofer. The size of the box and vent tuning frequency, where applicable, determine the low-frequency performance and output capability of the subwoofer system. GTX woofers are primarily designed to be used in small sealed enclosures, however, they will also perform well in Vented, Band-pass, and Infinite baffle applications when properly designed and the limits of each enclosure type are understood. Instructions which follow will give you simplified guidelines to build a Sealed enclosure for your subwoofer. The data sheet included for your individual model will give specific enclosure recommendations. For more complex designs, such as single and dual-vented band-pass types we suggest a computer-assisted design from the JBL SpeakerShop program or its equivalent, available from your JBL dealer. If this is not available to you, the JBL Customer Service department will be happy to assist you. Infinite Baffle designs are popular because they don't require complex design and construction, and can sound very good when solidly installed. However, because there is no enclosure to control cone motion, the power handling and maximum output level is reduced from that in a sealed or vented enclosure. Refer to the "Points about Power Handling" section for more information.

Automobile Acoustics

The acoustics of the vehicle influence bass performance tremendously. Fortunately, the small interior volume of most cars and trucks increases low bass performance sufficiently to reduce the required enclosure size. As a general rule, below 50-80 Hz (depending on interior size) bass response increases at a rate which approaches 12dB per octave as the frequency decreases. This adds a significant bass reinforcement to the actual output of the subwoofer. If this is not addressed in the design of the enclosure, bass performance may be boosted to the point where it is actually too strong for some tastes. For others, there is never too much! The enclosure design charts on the driver specification sheet contains two sets of design curves. The solid lines represent an enclosure designed by conventional formulas before it's installed in the vehicle. The dashed line represents a tuning which takes approximate vehicle acoustics into account (In-Car Response). Examples of how this affects the response of typical sealed and vented enclosures is shown on Figure 1 and Figure 2.

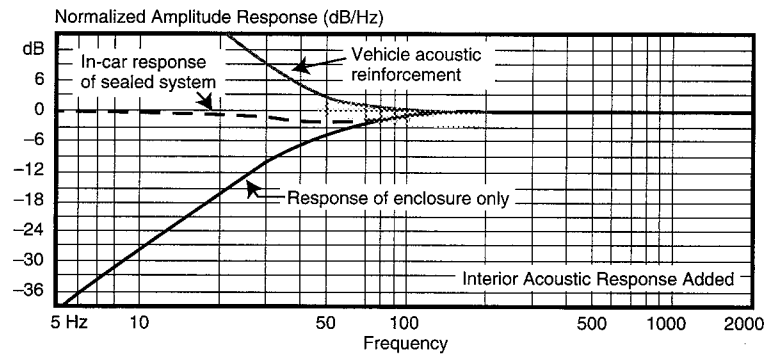


Figure 1. Effect of vehicle acoustics on sealed enclosure response

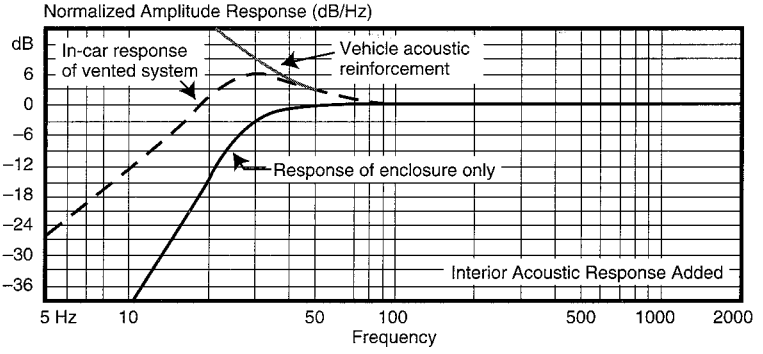


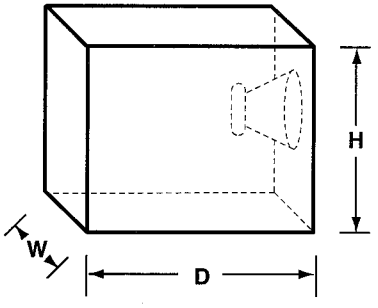
Figure 2. Effect of vehicle acoustics on vented enclosure response

Sealed and Vented Box Design

Please refer to the specification sheet included with your JBL driver. This sheet contains the recommended box sizes and their calculated frequency response as well as their "In-Car" calculated frequency response.

Box Construction Tips

The GTX subwoofer will only sound as good as the enclosure it is mounted in. By building an enclosure that meets the guidelines listed below, you will get the high performance bass that you sought when you stepped up to JBL.



1. Box dimensions – When possible, do not make the height, width and depth of your subwoofer enclosure dimensions equal or multiples of each other. This will minimize standing waves and resonance in the cabinet. Example: Ideal - 26"h x 17"w x 10"d. Not ideal: 30"h x 15"w x 9"d (30 is a multiple of 15).

2. Enclosure material and thickness – Use MDF or particleboard at least 3/4" (19mm). For woofers larger than 12" or smaller woofers with large amplifiers use 1" (25mm) thick MDF or particleboard.

3. All joints should be glued and screwed (no nails). The cabinet should be airtight and must include adequate bracing to minimize resonance.

4. Apply a 1" thick sheet of fiberglass or polyester to interior walls (except the baffle board) of all vented enclosures. For sealed enclosures (no porting) fill the

entire volume with fiberglass or polyester (12-16 oz. per cubic foot). If you do not wish to use damping material then make the box size 10% larger than recommended on the graphs.

5. Ports – Construct from PVC pipe or cardboard tubing with a wall thickness of at least 1/16". The end of the port tube must be kept one port diameter away from either the inside of the box or any surfaces in the car.

Points about Power Handling

The power handling of any subwoofer is related both to its ability to dissipate heat and to the maximum cone excursion limits.

Too much electrical power can cause the wire in the voice coil to overheat and burn out.

Too much cone motion can cause the cone to reach its mechanical limits and damage the subwoofer. The GTX subwoofer motor structure and voice coil can easily handle an amplifier rated to deliver up to the continuous power rating of each woofer. This is an electrical rating that is dependent upon an enclosure design which keeps the woofer cone from reaching its mechanical limits when the amplifier delivers high power. Properly designed Sealed, Vented and Band-pass enclosures are capable of this control.

At the same power levels Infinite Baffle designs allow greater cone excursion, and the power rating of the Subwoofer must be reduced to reflect this. Infinite Baffle subwoofers (no enclosure, sometimes called "Free-Air") will typically have much longer cone excursion than subwoofers mounted in an enclosure.

Sealed enclosures exert some control over excursion as a result of the air inside the enclosure acting as a spring against the woofer cone motion. Large enclosures typically allow higher excursion than smaller ones.

Vented and Band-pass enclosures have the lowest excursion as a result of the port tuning effects, but vented will allow for high excursion outside the port tuning range. Single-tuned band-pass enclosures provide the lowest overall cone excursion.

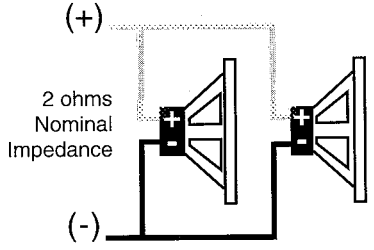
Please refer to the specifications sheet of your particular GTX model to get the exact numbers regarding power handling, excursion, and recommended box sizes.

Speaker Connection and Combination

The GTX subwoofers typically have 4 ohms nominal impedance.

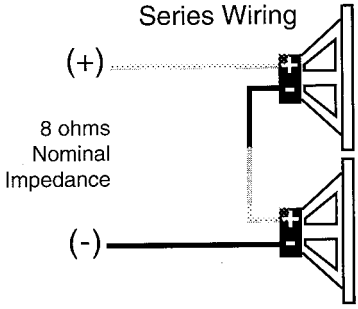
If you are connecting more than one speaker in parallel to an amplifier channel, make sure your amplifier will drive a 2 ohm load.

Parallel Wiring



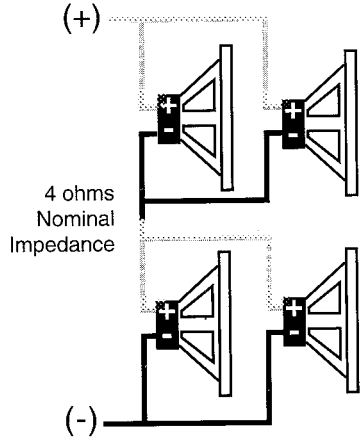
If your amplifier will not drive a 2 ohm load, we recommend that you connect each set of speakers in series to create an 8 ohm load as shown here.

Series Wiring

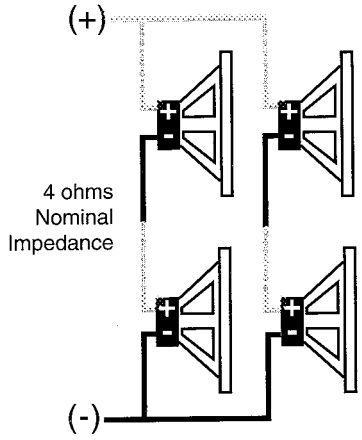


Four woofers can also be wired (as shown below) in parallel/series or series/parallel so that the amplifier will see 4 ohms nominal impedance.

Parallel/Series Wiring



Series/Parallel Wiring



If you want to drive more than four speakers with one amplifier, please consult your JBL dealer for more information.

JBL Consumer Products, Inc.
80 Crossways Park West
Woodbury, NY 11797

8500 Balboa Blvd.
Northridge, CA 91329
800 336 4JBL in the USA

H A Harman International Company

Part No. GTXSUBOM

PI-145 7/95