

600GTi
AUTOMOTIVE 6 1/2" WOOFER/MIDBASS
TRANSDUCER WITH CAST FRAME
INSTALLATION GUIDE

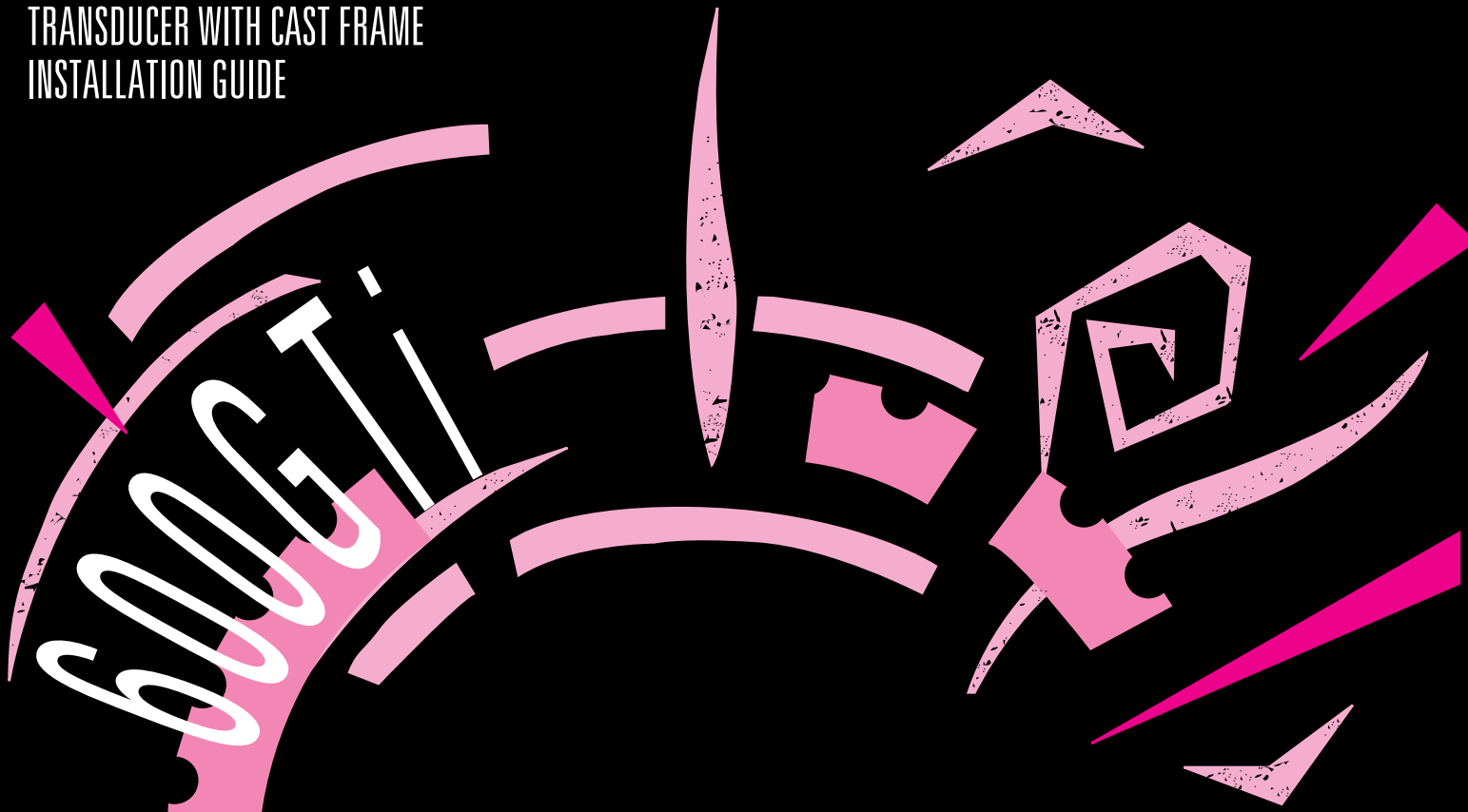
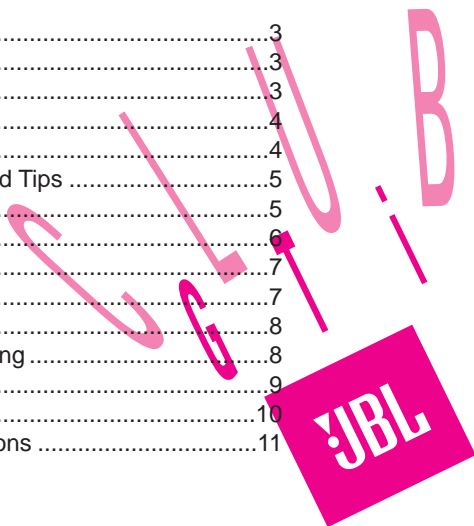


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Welcome to Club GTi

Thank you for purchasing the finest automotive Component woofer/midbass transducer JBL has ever produced. As a GTi Competition Series owner, you are a member of a select group of people who enjoy the most advanced mobile audio products available. We call this group "Club GTi." By sending in the customer information card, which you will find attached to your warranty, we will automatically register you as a Club GTi member which will give you access to exclusive Club GTi apparel and other special offers we will make available from time to time. 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 this document as proof of purchase in the event that you ever need warranty service. It is also useful for insurance purposes and for establishing value when you re-sell your vehicle.

About This Manual

Because of the performance capability of your GTi Competition Series product, and the variety of potential system configurations, we strongly recommend that you have the system professionally installed. You will also get a better warranty if your equipment is professionally installed by an authorized GTi dealer and you have your warranty card stamped. This manual provides information on installation and usage to help a skilled technician get the most from your GTi Competition Series product. This manual does not cover basic information about installation which is common knowledge to a professional installer, except for information which is unique to the 600GTi Woofer/Midbass.

If you feel you possess the necessary skills, and prefer to install the equipment yourself, this manual will provide you with the necessary specifics to properly use the 600GTi in typical installations. Consult your JBL dealer, or a qualified technician, for more information.

Autosound at its Best

The 600GTi Woofer/Midbass 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 600GTi Woofer/Midbass incorporates a high polymer laminate pulp cone which is especially suited to the unique acoustic and environmental requirements for an automotive woofer/midbass unit. The 600GTi has been engineered to provide excellent power handling, optimum transient attack and balanced frequency response.

The 600GTi Woofer/Midbass uses a cast frame to secure the powerful Barium Ferrite Magnet based motor structure. The rigid cast frame prevents resonance and flexing in the frame thus reducing distortion. In the 600GTi, the high concentration of magnetic power generated by the large motor structure is coupled to a 2" Edge-wound Aluminum Wire High Temperature Fiberglass Voice Coil. This powerful motor structure delivers dynamic midbass while its large diameter and

fiberglass former assure extremely high thermal power handling.

A high polymer laminate cone is used because of its excellent combination of high stiffness and low mass. This lets the 600GTi reproduce the powerful attacks of percussive bass with immediacy and impact.

The cone motion of these high excursion designs is controlled by an Aromatic Polyamid Fiber spider. Because it is seven times stronger than conventional spiders, this new material is able to control the extreme motion of the cone while maintaining musical accuracy with incredible ruggedness.

What does all this technology add up to? A driver with smooth frequency response, excellent transient response, and high output capability all in a rugged package. The result is exceptionally dynamic and accurate music reproduction over the bass and midbass frequency range that cuts through road noise and provides a solid musical foundation.

Designing Your System

The overall quality of any system design is a result of how well all of the components work together, not just the result of the performance of any one component. JBL GTi Series Tweeter, Woofer/Midrange, Coupled Component and Subwoofer Transducers are the ideal companion products to your 600GTi Woofer/Midbass. Each of the GTi Competition Series products are designed to complement the others to provide the highest performance with the simplest and most predictable system design. To use the 600GTi as the woofer or midbass transducers in a high quality system, we recommend you use a high quality active crossover such as JBL's GTX47, GTX4 or GTX2 to provide optimum matching to your subwoofer or midrange loudspeaker. If you prefer passive crossovers, we recommend that you use only high quality audiophile grade film-type capacitors and low DCR inductors to get the most out of your system. The most popular system configuration is a hybrid using an active

crossover for the subwoofer to woofer/midbass crossover point, a second active crossover for the midbass to midrange crossover, and a passive crossover for the midrange to tweeter crossover. Your GTi Competition series dealer is uniquely qualified to help guide you on the best system configuration for your needs.

Component Placement

The location of each of the loudspeakers plays a vital role in achieving proper frequency response and spacious imaging. Because the 600GTi Woofer/Midbass have an extremely wide and smooth dispersion pattern, excellent performance may be achieved in any vehicle. Due to the wide variety of vehicles, there is not one "right" way to locate the 600GTi, however knowledge of the following considerations will help you get the most from your system:

1. The most spacious stereo image is achieved when the speakers are placed as wide apart as possible. The lower the crossover frequency is set, the

less sensitive your ear will be to the exact position of midbass frequencies. The best system imaging is usually achieved when the major portion of the musical spectrum is handled by the full-range system and the midbass drivers only reproduce the frequency range below 200-250Hz. This makes the exact location of midbass speakers less critical than the mid and high frequency components in the system.

2. The best center image will be achieved when the distance from the left speaker to your left ear is as equal as possible to the distance from the right speaker to your right ear. This is most easily achieved by placing the 600GTi as far forward as you can.
3. The best system integration is achieved when the 600GTi is mounted close to the midrange. Installing the midrange close to the 600GTi helps smooth the transition from midbass to midrange at the crossover point.
4. You will get the best frequency response when the path from the speakers to your ear is unobstructed.

5. Because of the high acoustic energy capability of the 600GTi, they must be securely mounted in a rigid panel which is free from resonances, rattles and air leakage.
6. Due to the low frequencies reproduced by the 600GTi, an enclosure will enhance performance when it is possible to accommodate one in the available space. Use the Thiele-Small specifications to design a sealed or vented enclosure using standard formulas. Thiele-Small specifications are listed in the specifications section of this manual.

Installation Warnings and Tips

- Be careful not to cut or drill into fuel tanks, fuel lines, brake or hydraulic lines, vacuum lines or electrical wiring when working on your vehicle. Inspect behind panels before you cut or drill.
- Be sure to check for clearance of window, cranks and linkages when mounting speakers in door panels.
- Do not use the speakers unmounted. Failure to securely mount this product could result in damage or injury, particularly in the event of an accident.
- Although the materials used on the 600GTi are inherently water resistant, do not mount the speakers where they will get wet.
- Always disconnect the ground wire from the battery before doing any work on the vehicle.

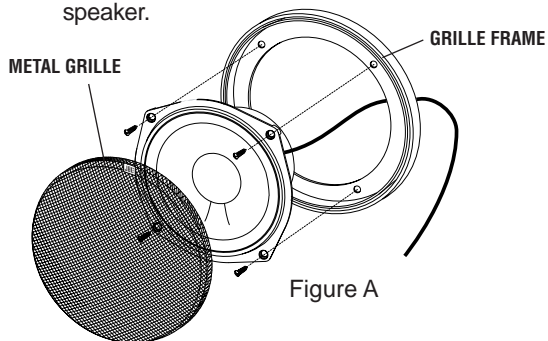
Mounting Instructions

Pick a mounting location after reading the recommendations in the Component Placement section of this manual.

600GTi Mounting

Mounting the Speaker

1. Use the grill included in the package to mark the location of the four screw holes and the speaker cutout holes (cutout hole size listed in Specifications section). Before cutting or drilling make sure that there are no car components, electrical wiring or any other items that could be damaged.
2. Cut out the speaker hole at the mounting location and drill the four marked holes with a $\frac{1}{8}$ " (3mm) drill.
3. Run speaker wire to the hole location, making sure that either an active or passive crossover is connected to the speaker.



4. Connect the speaker wire to the speaker by either soldering (preferred) or using crimp terminals. The 600GTi uses a .205 flat blade terminal for the + connection and a .110 terminal for the - connection.
5. Mount the speaker to the hole location using four #8 x $1\frac{1}{4}$ " screws as shown in Figure A.
6. Push the metal grille down onto the grille frame, making sure to align the logo as desired.

Note: The metal grille is designed so that it can be covered with grille cloth if desired. Simply remove the metal grille from the grille frame as shown in Figure A. Then use spray adhesive to glue and wrap the grille cloth to the metal grille. Push the metal grille with cloth back in the grille frame. For even better interior matching it is also possible to use plastic compatible paint to match the grille frame to the vehicle's interior color.

Wiring

Use 2-conductor stranded type, insulated wire to connect the 600GTi Woofer/Midbass and Tweeter to the included crossover, and the crossover to the amplifier as shown in Figure B. A minimum wire gauge of 18AWG is recommended, with larger size suggested for wire runs longer than 10 feet.

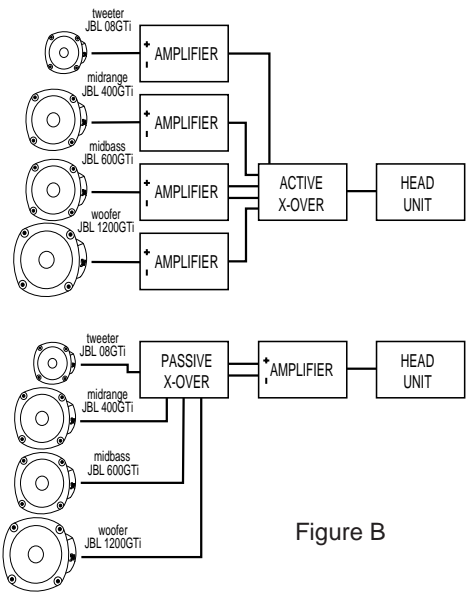


Figure B

The polarity (the positive / negative orientation of the connections) for every speaker and crossover to amplifier connection must be consistent from left to right channel to assure proper imaging and optimum frequency response. This does not mean that the 600GTi should always be connected in the same polarity as the other drivers in the system however. It is possible, that due to the difference in the distance the sound travels from the woofer/midbass to your ears compared to the distance from the woofer/midrange or subwoofer in a typical system, and the short wavelengths of sound at the crossover frequency, that a connection where the midranges or subwoofers are connected in reverse polarity from the 600GTi Drivers may actually result in better sound. Because there is no way to accurately predict this before installation, we recommend that you try the connection both ways, and leave it in the polarity that gives the smoothest audible transition between the woofer/midbass, subwoofer and/or midrange. When the subwoofer, midrange, and midbass drivers are

mounted close to each other, the in-phase connection will usually yield the best sound. Active crossovers such as the JBL GTX47 sometimes include a phase switch that lets you easily try both polarities by merely flipping the switch polarity.

System Connections

There are a variety of system options available with the 600GTi. The simplest configuration is to use the 600GTi low passed. In this situation, the 600GTi is used as a small subwoofer. In small vehicles at moderate power levels this will yield good sound. You may also wish to use the 600GTi in multiples, for example four 600GTi Drivers will move nearly the same air volume as a pair of 10" drivers. This is a good solution when you have a narrow area that won't fit larger diameter subwoofers. The best performance will be achieved in a high-end 4-way system which includes subwoofers and additional midrange and high frequency transducers. Here the 600GTi is at its best, adding impact and power to the midbass

frequencies. Because the 600GTi are specifically designed for midbass frequency operation, in a 4-way system as described they should have their low and high frequencies blocked by an active or passive bandpass crossover in order to achieve the best system fidelity and the widest dynamic range.

For the best performance, we recommend that an active crossover with a minimum of 12dB per octave slope be used for the transition point between the Subwoofer and the 600GTi. The optimum crossover frequency for this transition is dependent on the specific components used, the vehicle, and other installation details. As a general rule, the crossover frequency should be as low as possible to achieve the best system imaging. You can fine-tune the crossover after the installation is complete for the best sound. A good place to start your tuning process is approximately 50Hz for the subwoofer to midbass high-pass crossover point. Higher crossover frequencies will allow the speaker to play louder. Since no crossover is perfect, it is advisable to keep your

crossover points away from the range where your hearing is most sensitive. Therefore we recommend that you try to keep the low-pass frequency below 250Hz. This lets your full-range system reproduce the frequencies covering the most important vocal and lead instrument fundamentals and their harmonics, which will help optimize imaging.

If you prefer to use all passive crossovers, you will need to construct or purchase a band-pass filter for the desired midbass frequency range and install it in-line ahead of the 600GTi. Although the wide range and smooth roll-off of the 600GTi allows the use of a simple 6dB per octave filter, for the best system dynamic range, we recommend that a minimum slope of 12dB per octave be used.

The most advanced system designs use active electronic crossovers such as the JBL GTX2, GTX4 or GTX47 at both the subwoofer to midbass transition point and at the midbass-to-midrange transition. The maximum recommended RMS amplifier power routed directly to the 600GTi is 300 watts.

Speaker Break-In

The 600GTi Woofer/Midbass uses many high strength materials which benefit from a break-in period to achieve top performance. The 600GTi will reach maximum performance after playing for about one hour at a moderate volume level.

A Note on Power Handling

As a result of their high efficiency, all JBL loudspeakers will produce reasonable volume levels in the automotive environment using very little amplifier power. However, the use of a low-powered amplifier to attain very high volume levels could lead to overdriving the amplifier. This will generate high distortion levels which can easily damage loudspeakers, *even if the rated power of the amplifier is below the rated maximum power handling of the loudspeaker!*

As a general rule, do not turn up the volume control past the point where you hear distortion in the form of either signal distortion from an overdriven amplifier or

mechanical noise from an overstressed speaker. *For the best performance and system reliability, you should select an amplifier with an output rating greater than the maximum power likely to be used to generate the desired volume levels.* If you want your system “Loud + Clear,” we suggest that you step up to a JBL power amplifier which has an RMS power rating equal to, but not exceeding, the *Maximum Recommended Amplifier Power* listed in the specifications of your specific JBL speaker. This margin of reserve power will ensure that the amplifier will not attempt to deliver more power than its design allows. Your dealer will be happy to point out which high-power JBL amplifiers are optimum for your application and listening habits.

Following these guidelines will provide virtually distortion-free sound reproduction and long loudspeaker life.

In Case of Difficulty

The most common difficulties are noise, distortion, and intermittent connections.

System noise is usually not the fault of the 600GTi. Hiss or "alternator whine" is most often the result of faulty grounding of the system electronics or improper setting of amplifier level controls. An exception to this is if the passive crossover networks are mounted near a source of radiated noise, the network may pick-up this noise with sufficient power to drive the 600GTi. For this reason, be careful not to mount any passive crossovers near wires carrying high currents such as battery cables or wires leading to ammeters or tachometers.

Distortion is usually the result of overdriving one or more components in the system. The problem is most likely insufficient amplifier power, or improper setting of gain controls. Refer to the instructions which came with the electronics for assistance. The 600GTi will not play as loudly, or handle the full rated

power, when used without a subwoofer and associated high-pass crossover. When using the 600GTi without a high-pass filter, be careful to limit the volume level to that which can be reproduced without audible distortion from the speaker.

If you want to talk to us about any problems, call JBL Customer Service at 1-800-336-4JBL (4525) between 9AM and 5PM eastern time.

Specifications:	600GTi
Frequency Response:	45Hz – 3.5kHz
Recommended Minimum High-Pass Crossover Frequency for High Power Operation:	50Hz
Continuous Power Handling With 12dB Passive Network High Passed at Recommended Minimum Frequency:	300 Watts
Continuous Power Handling When Used Without High-Pass (Subwoofer Operation):	75 Watts
Minimum Recommended Amplifier Power:	20 Watts
Maximum Recommended Amplifier Power Rating:	300 Watts
Sensitivity (2.83 Volts / 1 Meter):	90dB
Impedance:	4 Ohms
Dimensions – Woofer/Midbass Transducers:	
Overall Maximum Diameter (Mounting Tab to Mounting Tab):	7 ¹ / ₂ " (191mm)
Height:	3 ⁷ / ₃₂ " (81mm)
Mounting Depth:	2 ⁷ / ₈ " (73mm)
Cutout Size:	5 ⁷ / ₈ " (149mm)
Weight:	4 lbs. 9 oz. (2.1kg)

Thiele-Small Specifications:	600GTi
Free Air Resonance (Fs):	56Hz
Electrical Damping (Qes):	0.60
Mechanical Damping (Qms):	6.40
Total Damping (Qt):	0.55
Equivalent Volume of Compliance (Vas):	0.455 cu. ft. (12.9 liters)
Effective Cone Area (Sd):	21.7 sq. inches (0.014 m ²)
Center to Peak Linear Excursion (Xmax):	0.250 in (6.35mm)
Voice Coil DC Resistance (Re):	3.5 ohms
Voice Coil Inductance (Le):	0.24mH @ 1kHz
Voice Coil Diameter:	2 inches (50.8mm)
Voice Coil Length (Winding Length):	0.650 inches (16.5mm)
Air Gap Height:	0.250 inches (6.35mm)
BL Product:	6.4 T/M
Effective Moving Mass (Mm):	0.606 ounces (17.2 grams)

Note: The Thiele-Small specifications shown apply only after a break-in period of approximately 2 hours.

JBL continually strives to improve its products. New materials, production methods and other refinements may result in a change from published specifications and description. The changes will equal or exceed the original specifications, unless otherwise stated.

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