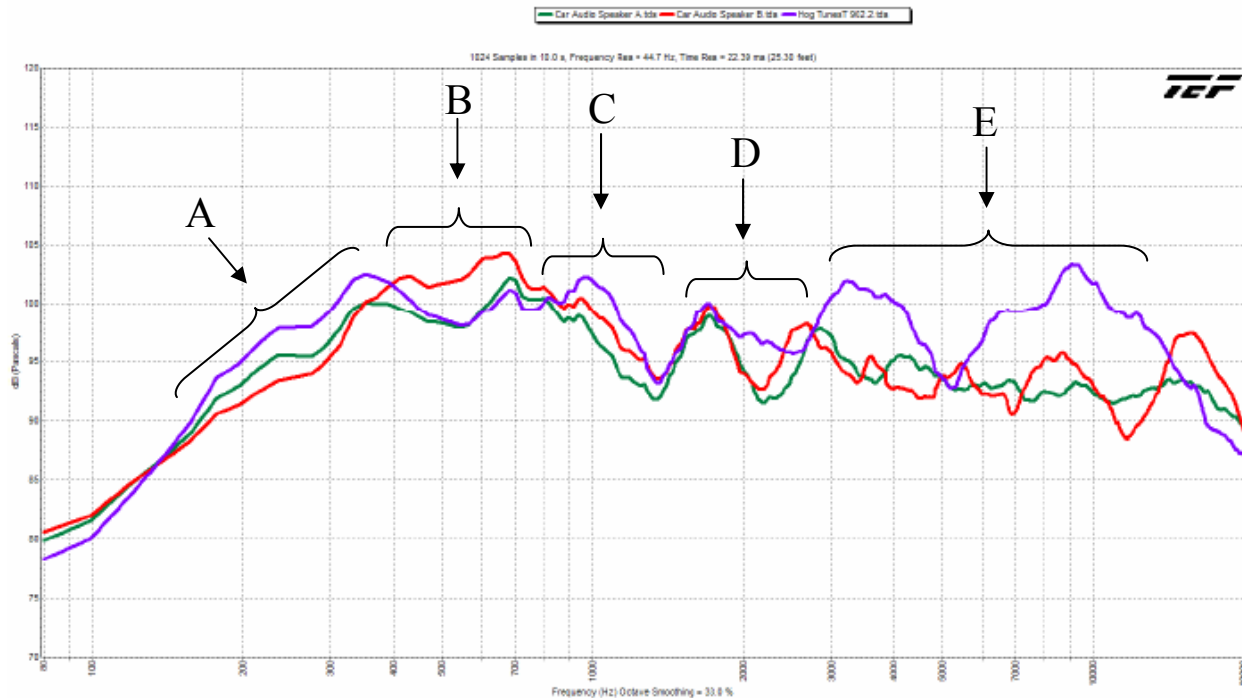


HOGTUNES

Audio Solutions For The Great American Cruiser

Why Doesn't Hogtunes Offer Larger Than Stock Fairing Speakers?



Installing a large speaker that plays through a smaller opening is the exact same principle race car series use to slow down competitors cars with a “restrictor plate” between the fuel delivery system, and combustion chamber! The opening in the fairing the speaker plays through IS the restrictor plate when larger speakers are installed!

Hogtunes can build any size/shape required for a specific project, but more importantly, can tailor the sound for any specific application as well. So why on earth would Hogtunes not offer a larger than stock fairing speaker, when that seems to be the “craze” in the current motorcycle audio marketplace? From a purely marketing point of view, it’s a brilliant idea to say the least, but is there any ACTUAL performance gains for the money? The attached graph shows on bike testing of Hogtunes 902.2-AA (purple line) vs. 2 competing larger than stock speakers.

Reading the Graph

Audio graphs are lot like horsepower charts. When looking at a horsepower graph the numbers along the bottom (left to right) represent the RPM. The numbers on the left (up and down) represent the horsepower. The point where these 2 intersect give the given horsepower for a given RPM. In an audio graph as above, the numbers along the bottom represent the frequency. In this case, the number along the bottom to the far left is 80Hz (Hertz). The lowest sound humans can hear is 20Hz which means the speaker has to operate at 20 revolutions (cycles) per second. As the numbers move along the bottom to the extreme right, the highest point of sound on the chart is 20,000Hz (a.k.a. 20k) which if our ears are PERFECT, is the highest point humans can hear. The further up the chart the line is, the louder that speaker is at that frequency. If we look at the purple line, look at 10,000 Hz, and see the speaker is producing approx 103dB of volume at that frequency.

Understanding the Numbers.

If you look at the up/down numbers on the left of the graph, you will see it starts at 70dB, and goes up in 5dB increments up to 120dB. Lets say were looking at 1000Hz on the graph. The green speaker is the quietest at that frequency. The red speaker is around 3dB louder at that point. Technically speaking, this 3dB difference is a lot. Keep in mind that all of these speakers were carefully measured with exactly the same power, 1 watt. For the green speaker to play as loud as the red speaker at 1k, it would require twice the power (2 watts) of power to play as loud at that frequency. The purple (Hogtunes) speaker is louder than both at this frequency. When expressing increases in sound volume in dB, 10dB is the amount that is considered to be twice as loud. It takes double the power to achieve a 3dB increase, and 10 times the power to increase sound levels by 10dB. Knowing that, have a close look at the graphs again...

The results:

- A) From around 180hz-350Hz Hogtunes plays the loudest. This area of sound would be considered low mid/upper bass. It is our opinion anything under 180hz is useless on a bike, especially at speed. The 180-350Hz is where we consider the lowest area of USEFUL sound for a properly designed motorcycle speaker.
- B) The red speaker clearly plays loudest from 400-700Hz. This is an area of sound considered mid/bass-nice job to them!
- C) From 900-1200Hz, Hogtunes speakers are the loudest. This area of sound is the midrange and is the most sensitive area of sound to humans. This built in feature allows Hogtunes to be heard much better "at speed".
- D) Around 2200Hz (2.2k), the other 2 speakers take a big "dip", This area of sound is also in the midrange. Notice the Hogtunes keeps playing in this area, once again enhancing the midrange so the speakers can be heard at speed.
- E) Obviously, the Hogtunes plays loudest in the higher frequencies. As part of the speakers design, we spent the time to decipher how hurtful the factory speaker grill is to the sound, and we compensated for this. We also recognize that higher frequencies increase clarity and like midrange, help the speakers "cut" exhaust and wind noise.

So how can a 5.25" speaker "keep up" to larger speakers that cost so much more? The real issue is that the factory speaker opening in the fairing is small, and only so much energy can go through that opening. "Jamming" large speakers through the small opening is a lot like taking a stock motor and putting really big pistons in it without doing head work so the motor can breath properly. You can brag you have a big motor, but is it really making the power it should? Hogtunes would never say we wouldn't build a larger size speaker, but if we do, we'll have made sure that it will come with better performance, not just "mines bigger than yours" bragging rights. For now, were quite satisfied we have excellent performance at by far the best price.

Details on How the Testing Was Done

The testing was done on a Hogtunes owned 2007 Ultra that lives at our year round test facility in Phoenix AZ. The testing was done using our lab equipment under the following parameters:

- *All curves represent the front fairing, right speaker only.*
- *Measurement system was a calibrated TEF 25USB and matching calibrated microphone.*
- *Power was supplied to the speakers via a Hafler Pro4000 studio amplifier with flat response. (20Hz-20k +/- .05db)*
- *Reference impedance for voltage calculations was driver terminal DC Resistance, measured with a Fluke 111.*
- *All measurements were performed using exactly 1 watt of input signal. The actual voltage applied was varied to compensate for large differences in loudspeaker impedances. (The Hogtunes speaker got the least voltage, because have the lowest overall impedance)*
- *Microphone placement was 30" vertical off seating surface, 1meter from right hand speaker location, on axis.*
- *This mic position was chosen as it closely represents the riders ear position, and is repeatable.*
- *The mic was mounted on an adjustable floor standing boom stand.*
- *The precise position of the microphone was checked and verified after each speaker change.*
- *Data was gathered outdoors with software in "gated mode" to eliminate any/all ground reflections in measurements.*
- *If replacement grills were supplied with competitors speakers, they were used to gather data.*
- *If speaker size adaptors were supplied with competitors speakers, those adaptors were used to gather data.*
- *The production (no lab queen) Hogtunes speaker was tested using the stock grill that came with the bike.*
- *Our test lab also operates as an independent test facility for many of the world's leading brands of home and car audio equipment. Their measurements are guaranteed accurate, repeatable, and if needed, are arguable in a court of law!*