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Subject: Power Compression and Heat sinks

Posted by [Leland Crooks](#) on Tue, 27 Dec 2005 23:35:43 GMT

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After much screwing around I finally have the finished sinks for hl10c's. The original set I built were for a's, which have cabinets under construction now. So I've been running without. My question is, how do these affect power compression? At the shootout the tuba 24's basically showed no change when we exceeded 400w. Yet the lab 12's in your 12PI continued to gain in output far beyond their rated max. Is that box, heat sink, or both? My primary purpose is woofer protection, but the capability for more power is appealing also. I've also built them for the betas in my tops. It's really stubby like the PI design. For further testing I just ordered a wireless oven thermometer that I'm going to insert for real world testing just for kicks. I figure if it will put a signal through a BBQ grill and send it 100ft it will probably get it outside the box for me to read. If not, hey I needed a grill thermometer anyway.

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Subject: Re: Power Compression and Heat sinks

Posted by [Wayne Parham](#) on Wed, 28 Dec 2005 15:07:16 GMT

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I'd encourage you to test the device thoroughly. We're not entirely in uncharted waters, but there are very few maps where we go, so to speak. The device will most certainly increase power handling and reduce compression if it is dissipating heat as it should be. It will also reduce the shift of electro-mechanical parameters, so you won't see a peak appear at low frequencies from voice coil heating at high power levels. But to quantify all this, you'll have to make some measurements. The digital thermometer is a good start, as it will show you the temperature with and without the device and you can compare the difference. I suggest heat soak tests where you run the woofer at high power levels for an hour or two. Measure temperature and check T/S specs. Then since you have the cabinets done, you might also check response of the system, and see how much it deviates from cold at various power levels.

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Subject: Re: Power Compression and Heat sinks

Posted by [Leland Crooks](#) on Wed, 28 Dec 2005 15:18:13 GMT

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I guess maybe the crux of my question is the understanding of power compression. Is it where the pressure in the horn throat has overcome the mechanical power of motor? And if so, am I correct in assuming that this can be altered by dissipating heat thereby increasing bl? Draw me an analogy to a hot rod motor, please. I understand them far better than electromagnetic motors.

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Subject: Re: Power Compression and Heat sinks  
Posted by [Wayne Parham](#) on Wed, 28 Dec 2005 15:26:06 GMT  
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Power compression is like heat soaking your engine. When the intake charge is hot, the air becomes less dense and you lose power. On an endurance run, the metals shift, expanding from heat and the pistons can scald the cylinders and the clearance between bearings and races can drop to zero. Then parts aren't riding on an oil film anymore, they're metal to metal. In the case of loudspeakers, the voice coil resistance increases and you lose voltage sensitivity. You also waste energy through heat loss and the system parameters change. A condition of thermal runaway sets up just before failure, where the voice coil radiates heat into the magnet which then re-radiates it into the voice coil and it gets hotter and hotter. Anything you can do to get heat out of the motor helps prevent this.

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Subject: Real men get blown  
Posted by [Leland Crooks](#) on Wed, 28 Dec 2005 15:34:17 GMT  
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So we're basically building an intercooler. Now we just need the turbo part of the equation. Got it. Thanks.

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Subject: Re: Real men get blown  
Posted by [Wayne Parham](#) on Wed, 28 Dec 2005 15:41:25 GMT  
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You've got it. With this arrangement, you can increase power safely. Not only does it increase power handling capacity, but it also reduces parameter shifts caused by heat, because it helps reduce heat buildup. It is an intercooler, same thing, just a heat exchanger.

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