
Subject: Heat sink, Heat exchange for driver/cabinet
Posted by [ARR_PG](#) on Mon, 21 Oct 2013 10:00:52 GMT
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hi I am looking to build a heat exchnager for a ciare 12" woofer.

There is a grill inside the cooling vent (pole piece) of the driver.

Are there any methods to removing this grill without cutting it?

I am aiming to make a heat exchanger as descibed via these links.

<http://audioroundtable.com/PiSpeakers/messages/19877.html>

<http://audioroundtable.com/PiSpeakers/messages/17334.html>

<http://audioroundtable.com/PiSpeakers/messages/17535.html>

<http://audioroundtable.com/PiSpeakers/messages/17999.html>

Any help much appreciated, thanks

Subject: Re: Heat sink, Heat exchange for driver/cabinet
Posted by [Wayne Parham](#) on Mon, 21 Oct 2013 13:45:50 GMT
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In Eminence drivers, the mesh is just pressed in, and can be easily pried out.

Check to see that the ID of the center pole has constant diameter throughout. Sometimes, when the back plate is pressed on, it compresses the center pole piece and makes it out of round. You want a constant diameter to maximize the area of contact between cooling plug and center pole. If it is not round and uniform, machine it to make it so.

You can use a hone, but even a drill press will suffice. Naturally, this step is easiest before assembly (or during a recone) because the magnet will capture the debris. That's OK unless it doesn't get into the gap. If debris does get into the gap, it is easy to clean if the voice coil isn't there, but practically impossible if it is.

Subject: Re: Heat sink, Heat exchange for driver/cabinet
Posted by [chrisR](#) on Sun, 27 Oct 2013 15:05:12 GMT
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And make sure to slather the cutter in grease. Not so much to gum up the works, but the grease

will trap the shavings. Maybe fill the bottom of the existing hole with rags that can be pulled back out, too. Trick from an old German mechanic that drilled for a spark plug thread insert in my VW head while the engine was assembled and in the car still.

Subject: Re: Heat sink, Heat exchange for driver/cabinet

Posted by [ARR_PG](#) on Tue, 29 Oct 2013 14:31:14 GMT

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Thanks, The only way to find out if the pole piece's diameter is stays consistent the deeper it extends is to remove the grill. Thanks for the heads up though.

If I cut it, the grease idea will have to be the way to do it. Please can you explain how to put rags under the grill before I cut it.

I have found this diagram, If I make the cooling plug too long, Will it effect the electromagnetic field that the voice coil uses to repel backwards and forwards.

Can anyone point out the end of the pole piece to have the cooling plug align flush with.

Its going to be literally a case of sticking my finger down the pole piece and guessing the depth. Good idea...Or not?

Sorry to ask but I want to make sure that this will definitely work before I cut. Cheers

(diagram is for a midrange speaker, See attachment, just as an example)

File Attachments

1) [revel-speakers-f52-midrange-diagram.gif](#), downloaded 7330 times

Subject: Re: Heat sink, Heat exchange for driver/cabinet

Posted by [Wayne Parham](#) on Tue, 29 Oct 2013 15:56:45 GMT

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The vent through the center pole has to have consistent diameter for best contact with the cooling plug. The only way to know is to measure it. But if the center pole hasn't been machined - and most aren't - you can assume that the diameter isn't consistent. How much inconsistency is there is really the question, and whether or not it is good enough to make an adequate thermal interface. Still, the best approach is to machine the pole piece to make it true.

The depth of the cooling plug should be the same as the depth of the center pole. It doesn't have

to be precisely the same length though. In fact, my loudspeaker designs allow the cooling plug to "float", in that the position of the cooling plug can change depending on the position of the dissipation plate it is attached to. This is because the plate serves double purpose as an access plate. I allow 1/8" movement in or out in the design of my cooling plugs to allow for changes in access plate gasket thickness (squish) and other loudspeaker assembly tolerances.

The goal is to have as much surface area between cooling plug and center pole as possible. So it is desirable that the plug be as long as required to extend all the way into the vent. It can even extend beyond the pole piece, into the cavity behind the dust cap. However, be careful not to extend so far that the center cap might strike the cooling plug at full excursion.

As for the magnetic effects, the cooling plug acts weakly as a shorting ring. It does have an affect, similar to the ones used to counter flux modulation. But it isn't a strong electro-magnetic modifier because of its position in the motor, and in my experience, I haven't see any measureable changes other than those due to thermal effects.

Subject: Re: Heat sink, Heat exchange for driver/cabinet
Posted by [ARR_PG](#) on Wed, 30 Oct 2013 11:33:31 GMT
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Thanks, I might buy one of the cooling plugs from this site. Can one be made up for a ciare 12.00sw?

Here is the idea I drew up a while back. I will make the plate connect to the plug myself, but it will be much easier to buy a plug already made.

File Attachments

1) [e0uy.jpg](#), downloaded 4890 times

Subject: Re: Heat sink, Heat exchange for driver/cabinet
Posted by [frederf69](#) on Sun, 05 Nov 2023 20:01:37 GMT
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I'm curious as to whether the JBL 2226H needs a cooling plug?, as that model comes with 'vented gap cooling' which is their method for heat dissipation. Sorry if this is a stupid question :roll:

Subject: Re: Heat sink, Heat exchange for driver/cabinet
Posted by [Wayne Parham](#) on Sun, 05 Nov 2023 21:19:02 GMT

Not a stupid question at all.

I think any driver would benefit from a cooling plug, some more than others. The cooling plug philosophy isn't intended to replace convection (vented) cooling but rather to augment it. It is really just a heat sink that conducts heat away from the pole piece and the magnet and is usually attached to some kind of plate that radiates and/or convects heat out of the system.

It's really useful in a horn-loaded application because diaphragm motion is limited. Since diaphragm motion is limited, convection cooling is limited too. Convection cooling is made possible by the pumping action from the cone cap pushing air across the voice coil and through the vent. But if the cone is horn-loaded, excursion is reduced and so convection cooling is reduced too. That's where cooling plugs help the most - They help reduce the heat in an application where venting is less effective.

This is also true at higher frequencies. Convection cooling works best in the bass frequencies because of cone excursion. So not only does horn-loading reduce excursion, but it's also reduced at higher frequencies. So ironically, you'll see thermal failures occur when a vented driver receives high-power, high-frequency signals without much on the low end. That's one reason why you really want to low-pass high-power subwoofers. It's also why clipping tends to increase the likelihood of thermal failures in speakers - it has a disproportionately large amount of high-frequency energy.

Subject: Re: Heat sink, Heat exchange for driver/cabinet
Posted by [frederf69](#) on Mon, 06 Nov 2023 08:07:19 GMT

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Thank you Wayne for your reply. I have a better understanding now. I have asked JBL as to whether the 2226H is machined to accept a cooling plug or not. I would be very grateful for any information on this.

Subject: Re: Heat sink, Heat exchange for driver/cabinet
Posted by [Wayne Parham](#) on Mon, 06 Nov 2023 14:34:45 GMT

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The JBL 2226 is not machined to accept a cooling plug.

Subject: Re: Heat sink, Heat exchange for driver/cabinet
Posted by [frederf69](#) on Mon, 06 Nov 2023 14:58:43 GMT

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This is (hopefully) my last stumbling point regarding the Four Pi. There is just no way I would be able to machine it myself. What are my options please?

Subject: Re: Heat sink, Heat exchange for driver/cabinet
Posted by [Wayne Parham](#) on Mon, 06 Nov 2023 15:21:24 GMT
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I don't think you'll find the need for a cooling plug in the 2226H, especially one used as a direct radiator, e.g. not horn loaded. It handles a ton of power.

Subject: Re: Heat sink, Heat exchange for driver/cabinet
Posted by [frederf69](#) on Mon, 06 Nov 2023 19:10:27 GMT
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That's good to know, thank you.
