Subject: Scratchy Speaker
Posted by Junior on Wed, 19 Sep 2018 09:17:13 GMT
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My computer speaker, which is an old speaker, sounds scratchy. I know I just need to buy a new one. What I'd like to know is if I can still fix the speaker on my own. I would like to learn how to fix things like the speaker.

Subject: Re: Scratchy Speaker
Posted by Wayne Parham on Wed, 19 Sep 2018 13:31:04 GMT
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That usually means the driver's voice coil has overheated and unwound, so it is rubbing. Most people just call that a "blown speaker" because it happens after it has overpowered for a while. You'll need to replace the driver.

As an aside, there are two common failure modes for a speaker driver: Thermal and Mechanical.

When a driver is overpowered with mostly medium and high frequency content, then the heat from the current through the voice coil causes the temperature of the motor core to rise above the limits of the adhesive that holds the coil on the former. Eventially, the glue melts and the coil unwinds. It then begins to buzz, and often stays this way until the speaker is repaired or replaced. Sometimes the loose winding catches on the center pole and tears or rubs through and create an open circuit, in which case the speaker won't make any sound any more.

When a driver is overpowered with mostly low frequency content, it may exceed its mechanical limits. The voice coil bobbin can strike the back plate or the suspension can tear. In either case, the speaker will "complain loudly" with impact sounds.

Less common failure modes are fusing, contact damage and environmental exposure. Fusing happens when a large high-current spike melts the voice coil. This is usually the result of an amplifier failure or misconnection. Contact damage happens when something strikes the diaphragm and dents or penetrates it. And exposure is when the diaphragm gets wet or has UV damage from the sun. I've seen cones so sunbaked that they fade to white and eventually become so dry and brittle they crack and nearly turn to dust when touched. Sometimes introducing a dry cone to a humid environment will help - That's something I've done to old tube radios to restore life to their speaker cones.

Subject: Re: Scratchy Speaker
Posted by sawyer25 on Wed, 19 Sep 2018 16:30:16 GMT
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I wouldn't dare to try and open up a speaker if it ever developed any problem (irrespective of the extent) because the last time I did this, the speaker got spoilt completely. It is much better to have a tech-savvy person fix it for you.

Subject: Re: Scratchy Speaker
Posted by Malfoy on Fri, 21 Sep 2018 04:38:04 GMT
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This problem solving would be a nice project. I don't want to destroy my speaker as it is still okay for me. If this happens to my speaker then I will try to tinker with it. It will go to the dump anyway, so I won't worry in breaking it.

Do all speakers have a similar setup?

Subject: Re: Scratchy Speaker
Posted by Junior on Fri, 05 Oct 2018 09:04:34 GMT
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So this means that the speaker is going to a normal "wear and tear" process. Does it also mean that even when we are setting a moderate volume that the speaker will eventually become scratchy?

Subject: Re: Scratchy Speaker
Posted by Wayne Parham on Fri, 05 Oct 2018 14:38:22 GMT
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No, voice coil unwinding isn't normal wear and tear. In most cases, it will never happen. I have some old radios with speakers that are nearly 100 years old and they still work fine.

When a speaker is overheated due to excessive power levels for a period of time, the adhesive that glues the winding to the bobbin begins to fail and the coil unwinds. This is failure mode that is caused by overdriving the speaker.

As long as you don't overdrive the speaker, the voice coil will stay intact for decades.

Subject: Re: Scratchy Speaker
Posted by Malfoy on Tue, 09 Oct 2018 16:33:35 GMT
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My father always tells me that older equipment lasts longer compared to newer counterparts. That may be the reason for the old radio maintaining a good sound or what you just explained. I go for both.

How about speakers that were exposed to hot and humid weather? Does the humid climate affect the speaker as overdriving it?

Subject: Re: Scratchy Speaker
Posted by Wayne Parham on Tue, 09 Oct 2018 18:50:16 GMT
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Ambient temperature has no effect on voice coil overheating. The temperatures inside the motor core get hot enough to cook before the adhesive begins to fail.

Subject: Re: Scratchy Speaker
Posted by sawyer25 on Wed, 10 Oct 2018 05:07:39 GMT
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Just by reading Wayne's comments, this looks like one of those things that you had better let a technician fix. I have had a certain speaker for 10 years and it has never developed any problem so I guess it depends on how they are handled.

Subject: Re: Scratchy Speaker
Posted by Junior on Wed, 10 Oct 2018 22:17:14 GMT
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So an update on my project, I made the problem worse because there is no more sound. I'm not sure whether I shorted or disconnected something. What I get from this is experience, and I learned from Wayne's comments.

Subject: Re: Scratchy Speaker
Posted by Malfoy on Thu, 11 Oct 2018 01:34:54 GMT
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@Junior, sorry to hear about that mishap. When I try to disassemble things, like cleaning the fan, I label them so that I don't misplace or mix up the different parts.

@Wayne, good to know that temperature won't affect the speakers. I asked that question with speakers at the ceiling in mind.
