

By David Jung

Vic Stolpe

Speaker re-coning, step by step

LAST MONTH, WE TALKED to master speaker repairman Vic Stolpe about some of the pros and cons of re-coning vintage speakers.

Well, if you've decided to re-cone your own speaker, you're in for a treat this month. Vic sat down and gave us a basic step-by-step tutorial of just what goes into the process of re-coning a speaker.

"Most vintage speakers are roughly the same," he said. "There are slight variations if you're working with field-coil units or some of the strange shapes that dotted history. But they all follow the same concept."

Here, in his own words, is Vic's breakdown for fixing what's broke down.

Step One: Cleaning the Frame

I can't stress enough the importance of a clean workspace. Again, any dust or debris that has a chance to get into the speaker will get into the speaker, so make sure all work surfaces have been properly cleaned.

You want to see exactly what you're working on, so what I usually do first is use a paint or soft-bristled brush to clean the surface of the speaker. Dust

builds up between the cone and the grillecloth.

Then, with a razor knife, slice out the cone, staying as close as possible to the outer edge. Once it's cut, pull out the old cone and set it aside.

I try to salvage the gasket on most vintage speakers. It's the thick circle that surrounds the outer rim of the speaker, usually made from pressed cardboard, felt, or cork. You might think I'm just trying to save a dime on a new gasket, but the truth is it's a lot easier and cheaper to use new gaskets.

The original gaskets for some older speakers, like the old Vox Alnico Blue or the G-12 Celestion, are stamped with a date code. And some brands, like Fanes, have gaskets made of felt or other weird materials.

Another thing to consider is that some of these gaskets are hard to find. Two of our example speakers (which are from a '60s 4x10" Fender Super Reverb) have four holes in their frames, the other two have eight. That's usually because there's less clearance for the upper speakers because of the transformers and other such components, and you might not be able to get at all the lugs without



Vic Stolpe cuts a speaker cone from its basket.

taking the whole chassis out. So what they do is put the four lug speakers on the top, and the eight lug ones on the bottom. But since it's hard to find four-lug gaskets, I do my best to salvage and re-use them.

So, carefully cut out the gasket. Get underneath it with your razor knife, and once you pry a section of it up, you can generally peel the rest of it out. Be careful not to tear it!

Then, carefully peel off all excess glue and cone from the gasket. Hope-

fully, this will come off in one piece. you've peeled the excess glue and come off the gasket and notice that some areas of it are thicker than other. you're going to have problems bolting the speaker to the baffle, and could tweak the frame out of alignment causing the new coil to rub.

So set aside your salvaged gasket then squirt some acetone on the voice coil assembly to break down the glue. The gaskets on most old Jensens and Oxfords are much easier to remove

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Preparing to remove the speaker cone.



The removed speaker cone.



Preparing to remove the voice coil.



Slicing out the gasket.



Cleaning excess glue from the gasket.



The removed gasket.



Applying acetone to the voice coil.

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than on newer speakers – most of the time, the glue on old speakers crumbles if you just touch it.

So, let the acetone sit for a couple seconds. Then, lift out the old voice-coil spider assembly (I use a dental pick) and set it aside.

Next, cover the gap in the voice coil with masking tape so nothing gets into it while you finish cleaning the frame. Then clean the frame as thoroughly as possible. Sometimes the glue is really tough, so you have to use acetone, lacquer thinner, or even MEK (which is really toxic, so be careful) to really get in there and wipe off everything you can. Use your razor to scrape away excess material – you need the frame to be as clean as possible.

Once the frame is clean, make sure the gap is clean where the voice coil sits. I use a shop vac to suck out loose dust or crud, then for good measure give it a blast of compressed air.

Then use a piece of paper about the thickness of a business card, fold it in half the long way, and wrap a piece of masking tape around it with the sticky side facing out. Slip that into the gap and rotate the frame. Even though you vacuumed it and blasted it with compressed air, you'll still get dirt and gunk on the masking tape. Cleanliness may well be the most critical part about re-coning or repairing a speaker; remember, the science behind sound is vibration, and anything left in there – even specs of dust or metal shavings – are going to vibrate against part of the speaker. It'll change the sound and in time can damage the speaker.

Step Two: Assembly

Okay, you've got everything cleaned up. Now, gather your new cone, spider, voice coil, gasket, and dust cap.

Measure the depth of the voice coil on the old voice-coil assembly and set the new coil to this dimension. When you set the voice coil depth, take the measurements off the original speaker, as opposed to a re-cone, because you don't know for sure if the last guy did it right.

I keep a card catalog with original-speaker voice-coil measurements, so when a previously re-coned speaker comes in, I can refer to it.

Using a small ruler, measure the distance from the bottom of the voice coil to the bottom of the spider. It's important to get this right because if you set it too low, you could bottom out and lose power in the speaker. Or set too high, it could jump out of the gap, come back down, and knock out the magnet mushroom, and you'll be re-coning again!

After you've set the measurements, start gluing everything together. First, stick a little shim in the voice-coil gap to keep everything in vertical alignment throughout the process.

Dry-assemble the coil, spider, and cone to make sure everything fits right, and once everything is cool, glue the coil, spider, and cone together. I like to use epoxy for this.

Once the glue is dry, remove the finished cone assembly and install tinsel lead wire to the cone. Some cones have rivets in them for soldering to lead wires, and some don't. The

cones on our example don't, so I had to punch two small holes in them so I could push tinsel lead through the holes and tape it to the cone, then put a dab of glue on each wire. This provides a little support so if they're tugged, they won't tear the cone or vibrate against it.

With the cone assembly completed, it's time to get the cone glued into the frame. I use glue that's similar to contact cement, but made specifically for re-cones. You can probably find it online at places that supply other parts for re-coning.

Run a bead of glue around the upper edges of the entire frame where the gasket rests, and around the area where the voice coil assembly sits. Since our sample speaker is an old CTS, it's hard to get one's fingers inside the frame to rotate the cone, so you want to make sure you've got your tinsel leads lined up with the terminal strip on the frame before dropping the cone assembly into place. Some larger speakers have enough room to get your fingers in and adjust the cone, but on smaller ones, especially old CTS speakers, it's near impossible.

So, lower the speaker cone assembly into place and press it on the glue. Then lay the gasket on top and clamp it down with binder clips. You want to get as many clips as possible on the gasket because you want even pressure all the way around the speaker.

The glue will usually set in a couple of hours, but I like to leave them overnight just to make sure. Once

it's dry, remove the shim from the voice-coil gap. Don't forget this!

Next, wire the voice coil. On a small speaker, wrap the coil lead wire around the tinsel lead wire at least once. On larger speakers, wrap it at least three times. Coil winders often do not leave enough lead wire on voice coils, especially when they're working in a tight spot. But the extra effort here is well worth it. If you've got big fingers, try a set of non-magnetic tweezers (a regular tweezers could leap from your hand and tear through the cone).

Solder the lead wires into place, then solder the voice-coil wire to the tinsel lead that goes to the cone. Snip off the excess, then glue them to the cone so they don't vibrate.

Now your basic assembly is done on the topside. Flip the speaker over and remove the tape holding the lead wires to the cone, and solder them to the appropriate terminals.

Keep these wires as short as possible; you don't want them too short where they're pulling on the cone or so long they buzz against the cone. Find a happy medium, then solder them in place. And remember to heat the part that you're soldering, not the solder itself. Then trim the excess wire.

Some speakers need a coating of liquid latex along the edge of the cone (some call it a "cone stiffener"). As sound waves travel up the cone, which is a nice hard surface, the latex helps smoothly break up the waves. A lot of older speakers don't have it, but a lot of newer ones do.



Using dental pick to remove the voice coil.



The removed voice coil.



Scraping the frame.



Folded business card.



Placing the cone in the frame.



Clamping the frame.

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Using a small brush to spread it evenly, hold the brush in one place on the cone edge and rotate the speaker on a lazy susan. Once it's dry, you're ready to test the speaker.

If you get a nice clean thump from the speaker when you use your finger to tap lightly around the cone, it usually means you've got a good re-cone. Hook it up and test it. If all is well, you're almost done.

Take the vacuum again and suck out whatever may have fallen into the voice coil, then install the dust cap. Again, if you have to make one, use the speaker's old one to size the new one; nobody makes felt dust caps anymore, so you have to make them from sheet felt. Cut a circular piece of felt using the old dust cap as a pattern.

After it's cut, put some glue around the top edge of the voice coil and lay the dust cap on top. As soon as that dries, you're good to go.

To break it in, I like to put the speaker on a signal generator for a little while. If you don't have one, you can break in your speakers in a much more enjoyable fashion – by playing through them. Enjoy!

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