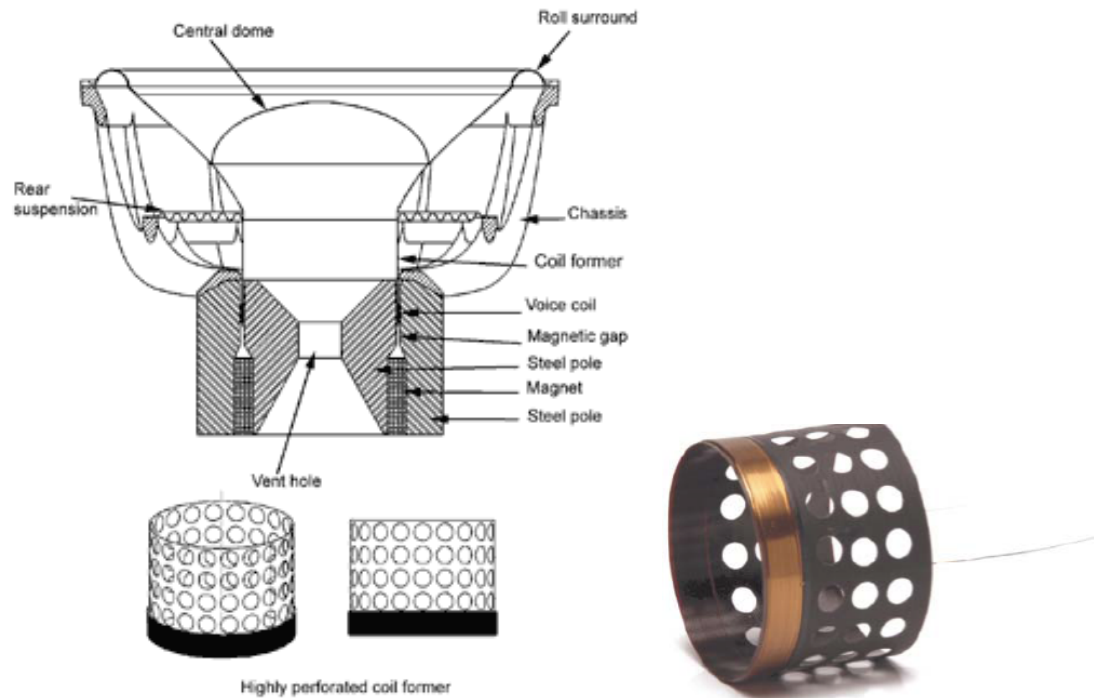


Highly Vented Former



In a manner reminiscent of a piston in a cylinder, the central pole of the magnet in a standard moving coil driver alternately compresses and rarefies the air trapped within the voice coil, behind the dust dome. There is an escape route through the narrow gap between the coil and pole but the air experiences considerable drag which in turn damps the motion of the cone, particularly at low frequencies where the displacement is greatest.

A common and simple way to solve this problem is to leave a large hole in the centre of the pole. The air now has an easy path to the outside world but it comes at a price for now there is a combination of an air volume and a connected duct. As with an open bottle or indeed a reflex loudspeaker system, the air in the duct reacts with that in the enclosed volume to form a Helmholtz resonator and at resonance the air in the tube reaches a peak in its motion while the movement of the cone is reduced.

Typically the frequency of this resonance is around 300 to 400 Hz which is well within the bandwidth of the C125 bass/ mid driver. Adjusting the size of the hole within the limits of what is possible without affecting the magnet doesn't improve things. Adding a row of hole around the coil former, however, was found to push up the resonance by a useful amount and to reduce its sharpness or 'Q' factor.

Perforated formers are well known but have the disadvantage of causing audible noise as the air rushes through the small holes. If the number of holes is increased to the point where the hole area approaches half that of the total it turns out that the resonance is moved right out of band and the Q drops to the point where it becomes difficult to actually measure the resonance. Added to this is the fact that the air noise disappears because of the reduced velocity so the solution is near perfect.