Over Excursion: How to Avoid it

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Over excursion is simply one way of pushing a driver past its mechanical limits. Over excursion damage is more prevalent on subwoofers because they're made to produce low frequencies, which by nature requires more cone movement. DD subs are built like tanks in their respective power rating classes, but extreme and/or prolonged over excursion will damage spiders, surrounds, cones, glue joints, and coils. The most common damage caused by over excursion is broken glue joints and ripped or torn spiders.

If you're interested in avoiding damage from over excursion here's a short list of things you can do that will prove to be very effective.

1. **Proper Suspension Break-IN**
2. **Proper Enclosure Tuning**
3. **Proper Use of your Subsonic Crossover**

1. If you're asking "Why do I need to break in a DD sub, I don't have to break in a brand X sub." The answer is simple, a DD sub's suspension is designed

to provide stability of the mass in the moving parts, and the spiders must exhibit a high level of control for use in a ported enclosure. We build DDs to sound good for years of service life, not just long enough to get it sold. This means the DD suspension will be stiffer than most other company's suspensions, and will require a little patience during the initial break in. After the woofer is properly broke in, you'll notice it plays deeper, with more dynamic range, and increased output.

CLOTH AND COMPOSITE MULTI-LAYER SPIDERS

For the initial **suspension break-in**, turn your subsonic filter up around 40 Hz for the first week or 12 hours of play time. During this break-in period we suggest listening to the system at a moderate level, and we highly discourage participation in SPL competitions. After the initial break in period you can begin to fine tune your subsonic crossover.

2. When you design or purchase an enclosure the tuning of the enclosure should always be a major consideration. The primary style of music that will be pumping out of your system should determine what enclosure tuning frequency you should aim for. If you intend on playing stuff with some heavy 25Hz bass drops and your enclosure is tuned to 40Hz the enclosure isn't going to lend much if any suspension control therefore you sub will have to go it alone. This generally isn't a good way to go since most the time, if you have a DD sub, you're using some sizable amplifier power, and without the aid of a proper enclosure this can easily push even our biggest baddest subs past their mechanical limits and straight into failure. On the other hand, when the enclosure and listening style is appropriately matched, the enclosure will act as the second half of the subs restorative force helping to keep excursion within tolerable limits, thus extending your subs life and your listening pleasure.

3. In last month's tech tip we started discussing proper use of your amplifier's

subsonic filter. While we'll go deeper into the world of subsonic filtration in a future article for this tip we'll touch on one the easiest and most effective ways to set your subsonic crossover to help limit over excursion. The main tools you'll need to do this are your ears. Every vehicle has a different sub frequency transfer function, and your vehicle's specific transfer function will depend on the vehicle's cabin and the tuning of the enclosure. This means when **setting up crossovers** there's not really a one size fits all setting. A quick and simple way to set your subsonic filter is to just play your system at normal listening volume with the most common style of music that will be played on your system. The next step is to turn your subsonic crossover down to 20hz, then begin adjusting the frequency up until the crossover audibly effects the subs output. Once this happens you have effectively determined the transfer function of your system. This setting may be visually higher on the subsonic dial than you think needs to be, but trust your ear. This procedure will help control the subs excursion, and it will also help to optimize your amplifier's power use. When your subsonic crossover point is properly set your amp won't waste power trying to push frequencies that aren't affecting how your car sounds, effectively allowing you utilize all the power you amp is producing in the bandwidth that actually sounds good.