

Most people have heard of an engine dynamometer. But you may not be familiar with a damper dynamometer - often just called a shock dyno. The basic ideas are the same. The shock dyno measures the "performance" of a shock just as an engine dyno measures the "performance" of an engine. *Note that the common American term "shock" is employed as opposed to the more accurate term "damper".*

In the case of a shock dyno, performance is measured as the resistive force that the shock exerts when the dyno tries to compress it. Since shock stiffness is proportional to the rate at which the shock is compressed, then the shock dyno measures the shock resistance for different speeds.

Furthermore, the performance of a shock is different depending on whether the shock is being compressed or extended. Thus the shock dyno measures the resistive force offered by a shock when it is both compressed and extended at various rates (velocities).

The data from a shock dyno is plotted as a pair of curves. One curve for compression and one for rebound. The curves represent resistive force vs. shock velocity. You would expect that if the velocity was positive for compression then it would be negative for extension (rebound). But to make the graph easier to read velocities for compression and rebound are both plotted in the positive x-direction.

However, to differentiate the curves for compression and rebound, one is plotted with resistive force in the positive y-direction and the other is plotted with resistive force in the negative y-direction. For the dyno curves in this section the resistive force in rebound is plotted as positive and the resistive force in compression is plotted as negative. This is somewhat arbitrary and some shock dyno's may plot rebound and compression in the opposite directions on the y-axis.

The shock dyno curves in this section were provided by Jay Morris of Ground Control. The results are for Koni Single Adjustable dampers for the BMW E30 M3. For those not familiar with the Koni SA's, they are adjustable only for rebound. The compression damping is fixed (but can be altered by rebuilding the shock). For the E30 M3 application it is not a simple matter to adjust the rebound - it requires removing the shocks from the vehicle. That is not a big problem as the damping rate really should be matched to the spring rate and then be left alone. True, in the top levels of motorsport it is common to adjust damping rates to achieve a proper setup. But this is usually over a relatively small range and is highly dependent on aerodynamic requirements, which the E30 M3 does not induce.

If some of the theory seems confusing then a look at the graphs should [clarify matters](#) »

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