# Understanding Temperature

The Roehrig Shock analysis software allows the user to warm the damper to a chosen temperature before starting a test.

A shock absorbers primary job is to dampen the motion of the spring. When the spring is compressed it stores energy that if left uncontrolled would result in the car bouncing around the track. By using a damper to absorb that energy, the release of the spring can be controlled to provide a more predictable vehicle. Now, where did the energy go? It was turned into heat by the damper; the kinetic energy of the spring was converted into heat by the damper. What does this all mean? Your shock goes on the car at ambient temperature, but after only a few laps the shock begins to heat up until it reaches some final temperature during the race. This heat changes the way your damper behaves.

Your shock changes as it gets hotter. How much it changes depends on many things: some of them are the type of fluid, the amount of gas pressure, the volume of the gas pressure, the valving and piston type, the seals and o-rings and the type and length of the lines to the reservoir. If you dyno your shock at 60 degrees and then at another time you dyno it at 90 degrees, you may see a difference based on nothing more than the affects of temperature. Your Roehrig software allows you to heat the damper up to a temperature that you determine. The standard company line is to heat all your dampers to the same temperature before running your test. That way your reference with regards to temperature is all the same.

The next point to think about is taking your shock to temperatures as seen on the race track. With some $5 temperature strips, you can get a reading on how hot your shocks get during the race. Then you can set your warm-up to that temperature. It would be a good thing to try sometime to compare the curves at your standard test temperature then again at your race temperature. If they are the same, great, if they are different then you need to understand why and be able to compensate if necessary. Also, pay attention to the gas test numbers at each temperature. Your gas pressure has gone up with temperature and this can also affect your car in good ways and bad.

Your software also allows you to do a temperature step test. Instead of doing a warm-up to one temp and then testing, this option allows you to create a table of several temperatures to test at, all in one test file. You can set it to warm to 100 deg and test then to continue to 120 and test then 140, 160, 180 and so on.

Further study:

If a shock cavitates at room temperature because it does not have enough gas pressure, what happens when you heat it up to the temperatures it races at? Does it gain enough pressure to stop the cavitation? This may allow you to run lower gas pressures than you imagine. Conversely, how much has the gas force changed? Does this added force affect the car late into the run?

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Michael's Messages
Roehrig Engineering

ROEHRIG ENGINEERING INC.
100 LEXINGTON PARKWAY * LEXINGTON, NC 27295
800-735-7265
WWW.ROEHRIGENGINEERING.COM