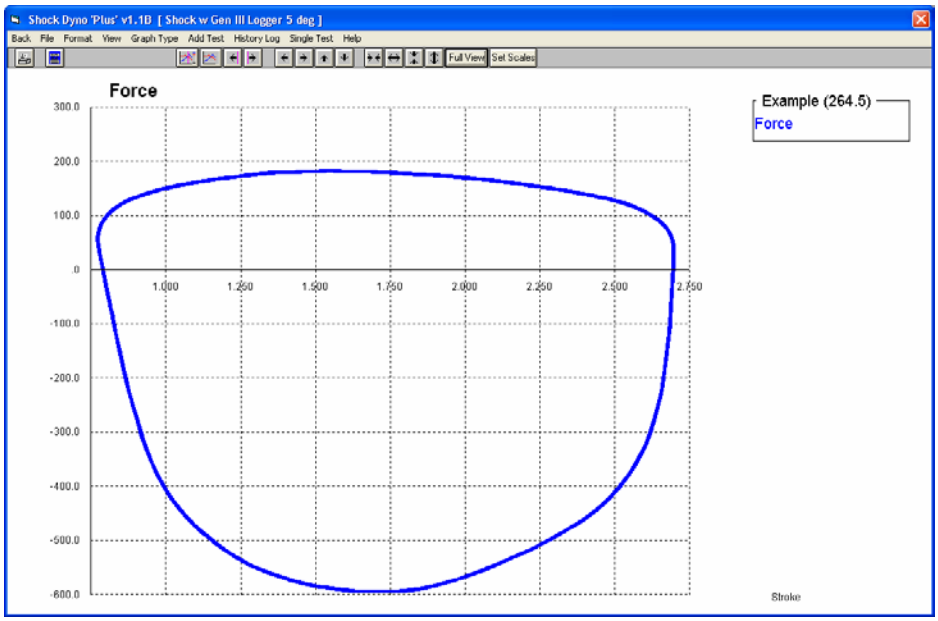
Graphs available from the Shock Dyno

The Performance Trends Shock Dyno has various graphs available. In the standard version, only Force vs Velocity can be graphed, but in 2 different formats. In the Plus version we have additional options.

This is a graph of shock force vs shock position (stroke). This is sometimes called a “football graph” or “potato graph”. This is what the raw data looks like before we do more analysis.

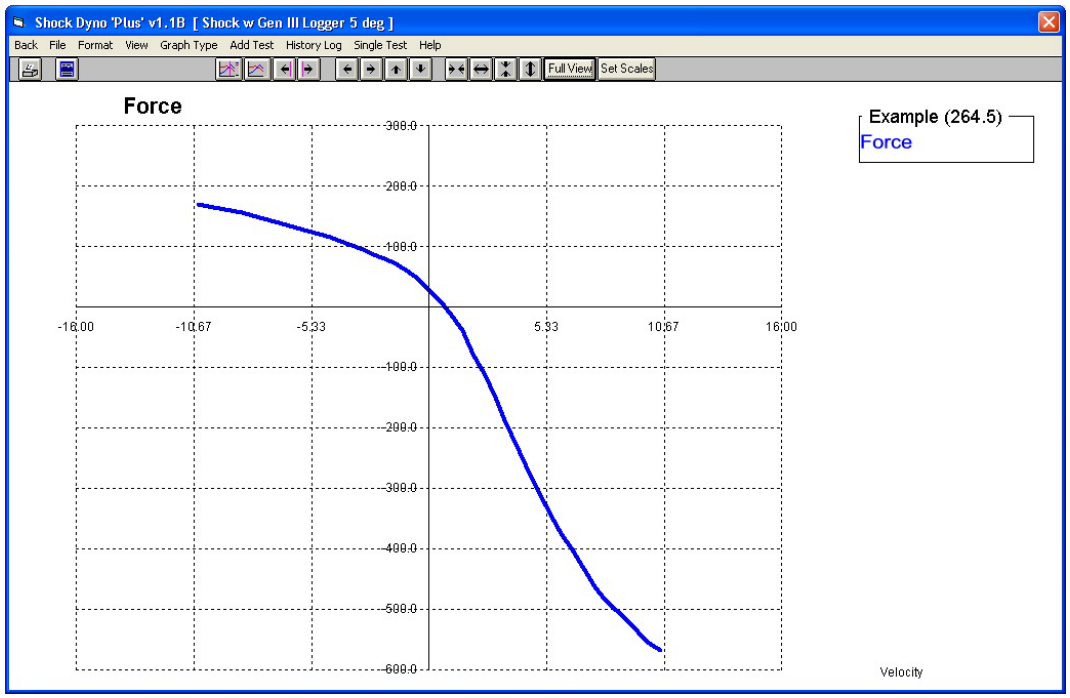


After we figure out velocity from position and the rate of change in position (the time to get to different positions), then we draw the force vs velocity graph. You can see that there is more than 1 force at each velocity. That is because the force measured as you accelerate through a certain velocity can be different than the force measured as you decelerate through that same velocity.

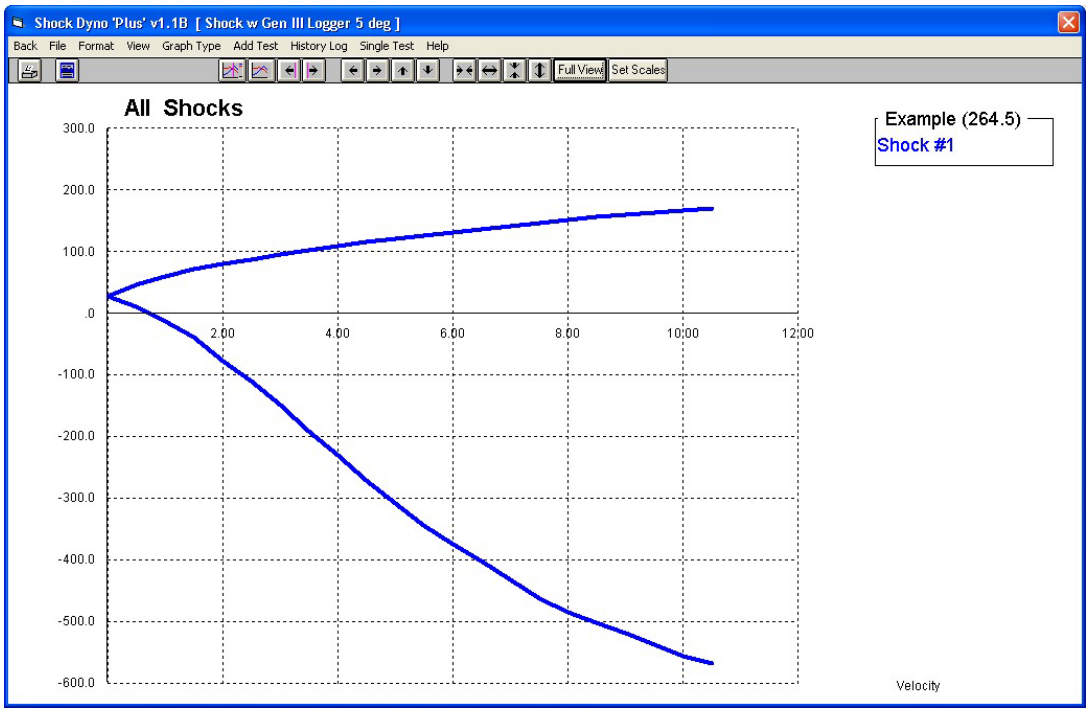
One reason for these accelerating a decelerating forces not being exactly equal has to do with the gas becoming mixed with the fluid, bubbling out of the fluid vs being forced into (suspended in) the fluid. Compliance in the shock canister (changing the volume of the fluid container) also has an effect.

To make things more simple to understand, we average the accelerate and decelerate forces at each velocity together to produce the standard force vs velocity graph. It can be presented as either force vs +/- velocity or force vs absolute velocity.

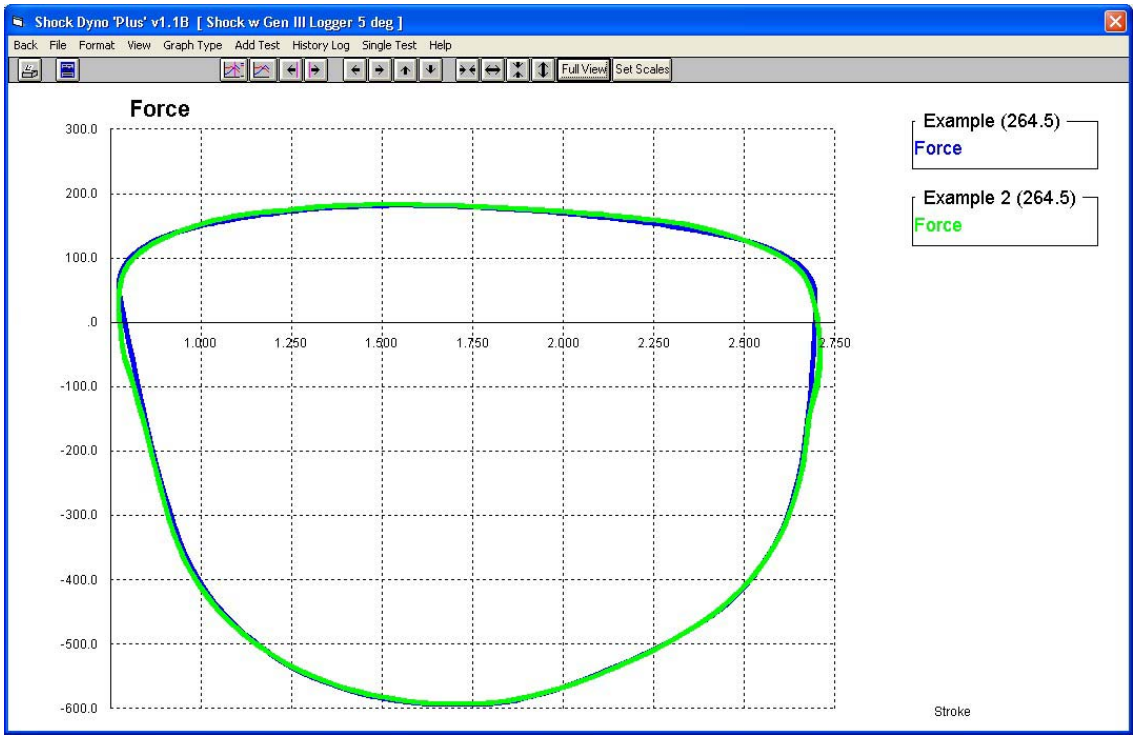
The graph below shows that the rebound (negative) force is much higher at -580 lbs max than the compression (positive force) at +170 lbs max. This is typical of “high tie down shocks”, shocks which compress easily, but do not easily rebound. These are used by many circle track racers. These shocks compress in the corners from downforce, and then hold the car down to reduce aerodynamic drag down the straights.



Here’s the graph of Force vs Absolute Velocity which most people are used to seeing.



The program also allows you to do overlay graphs, like shown here with the “football” graph.



Here’s an overlay graph of 4 different shocks, with the “cursor” line which lets you pick off the values of the different graphs at the point of the cursor line. The values are shown on the right side with the graph labels.

You will notice that all the graphs have some positive force at 0 velocity. That is due to the gas pressure which is always present, whether the shock is moving or not. The program lets you eliminate this “offset” so that the graphs DO have zero force at zero velocity, if you want.