

# Shock Absorber Dynamometer



SAN DIEGO STATE  
UNIVERSITY

## Project Summary

We wanted to build a shock absorber dynamometer for the SDSU Baja and Formula SAE teams. Our goal was to be able to measure shock dampening forces at various velocities.

Using a pneumatic cylinder, we cycle a shock mounted to a rigid frame. Using a linear velocity transducer and load cell, we are able to determine a force/velocity plot used to tune our shock absorbers and suspension designs. We are also able to determine the total energy absorbed by the shock absorber used to determine the cooling needed by the shocks.

The sensor data is recorded to MatLab through Arduino and a serial port. MatLab creates a real-time graph of shock position and velocity, and stores the data for later analysis.



**Team:**  
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## Uses

- Shock tuning
- Shock data recording
- Shock development

## Components

- Linear Velocity Transducer
  - Load Cell
- Aluminum Frame
- Pneumatic Components
- Arduino & Wiring

## Features

- Portable- Requires only a laptop and compressed air to work and is collapsible to fit in a backpack
- Cheap- 10% of the cost of a commercial shock dynamometer
- Adjustable- Can accommodate shocks from 4" to 18" in length to test anything from bike shocks to off-road vehicle shocks



**Sponsors:**



Trans-Tek Inc.  
Linear & Angular Displacement, Velocity Transducers