Suspension Group
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What Does a Suspension Do?

Generally, there are 3 primary functions of a suspension:

- Provide comfort for the rider
- Control the dynamics of the motion of the bike
- Guarantee grip, or wheel-to-surface contact
Lab Summary

- During this semester, we took apart the front and rear suspension and spent a great deal of our time using the parts cleaner to clean the grease, oil, etc. from the parts.

- We also used the sandblaster to knock off the rust from the front fork.

- Lastly, we used the diagrams from the manual to piece together the parts and assemble the front and rear suspension.
Front Fork

✗ Our motorcycle uses a Triple Tree fork design

✗ The front fork controls the movement of the front wheel and controls the springs that absorb shock.

✗ When the front fork dives (meaning the springs are allowed to compress), such as when a motorcycle brakes, this is called compression.

✗ Coming back up, this force is called rebound.
Spring for Front Suspension

To calculate the forces on a compressed spring, we use this formula below:

\[ F = k \cdot x \]

where:
- \( k \) = spring stiffness;
- \( x \) = working range of the spring.
The situation described by our calculations is:
 braking force applied to the wheel:

$$m \cdot t = (0.5 \cdot 3000) = 1500\,\text{N}$$
Speedometer

- To determine the “speed”, better noted as velocity, the bike needs to note two pieces of data:
  1. How many complete revolutions the (back) wheel makes
  2. The change in time

Using this information, the speedometer can estimate the velocity.

\[ \bar{v} = \frac{\Delta x}{\Delta t} \]

- \( \bar{v} \) = average velocity
- \( \Delta x \) = displacement
- \( \Delta t \) = change in time
The rear suspension, in simple terms, controls the upward and downward motion of the back wheel. Also absorbs a lot of the shock that the motorcycle takes. Almost universally in motorcycles, the design used is the swinging arm rear fork with shock absorbers. Our motorcycle uses a plunger-type suspension, however.
Progressive Rate

Our motorcycle uses linear rate, however
Ending Slide

Thanks for your time!