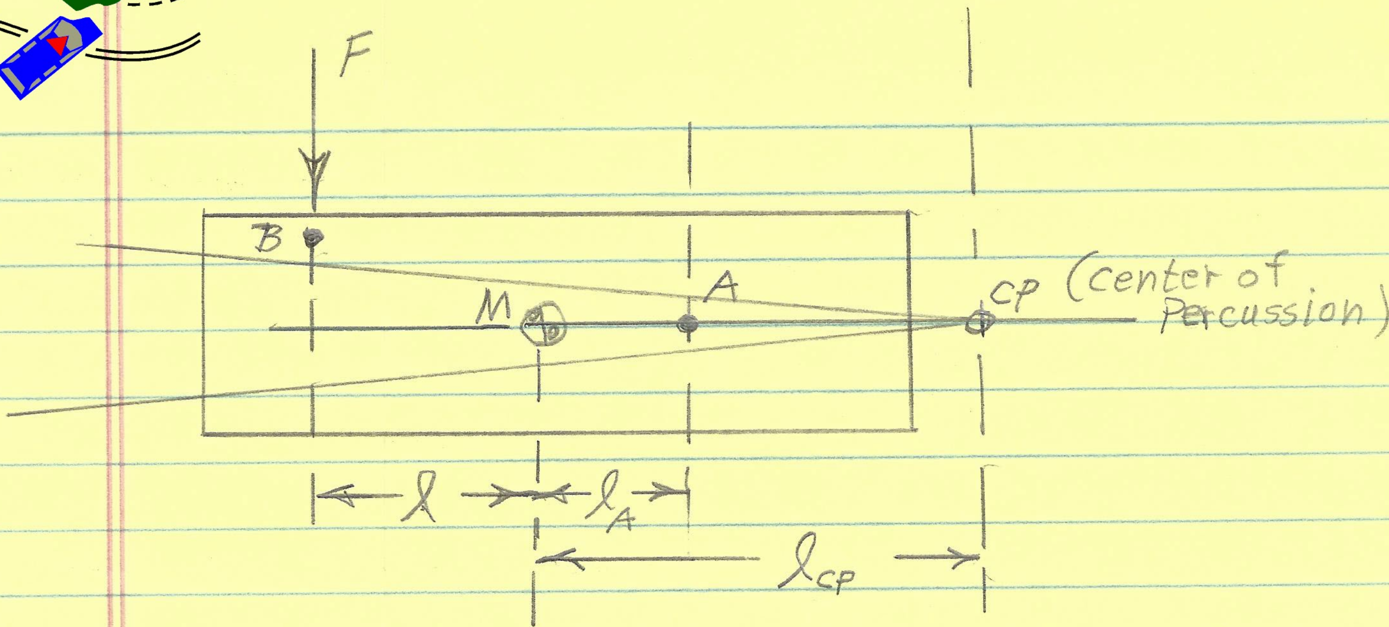


The effective mass at point B $= M\left(\frac{k^2}{k^2+\ell^2}\right)$

The center of percussion is located $k^2/\ell$ inches forward of the CG, where $k^2$ is the radius of gyration squared for rotations about the CG.

Since the center of percussion does not move laterally in response to force F, the motion at point A is a simple ratio of that at point B and at the CG.

$$\ddot{Y}_A = \ddot{Y}_B\left(\frac{\ell_{cp}-\ell_A}{\ell_{cp}+\ell}\right)$$

Since $\ell_{cp} = k^2/\ell$ , $\ddot{y}_A = \left(\frac{k^2 - \ell\ell_A}{k^2+\ell^2}\right) * \ddot{y}_B$ (1)

$\ddot{y}_{CG} = \left(\frac{k^2}{k^2+\ell^2}\right)\ddot{y}_B$ (2)

Check of eq'n (1)

IF $l = 0$, $\ddot{y}_A = \ddot{y}_B$ (No yaw rotation)

IF $l_A = 0$, $\ddot{y}_A = \left(\frac{k^2}{k^2+l^2}\right)\ddot{y}_B = \ddot{y}_{CG}$

IF $l_A = A$ (Distance from CG to front wheels),

$$\ddot{y}_A = \left(\frac{k^2 - Al}{k^2+l^2}\right) * \ddot{y}_B$$

For $\ddot{y}_A = 0$, $k^2 = Al$

If $l \approx B$ (Distance from CG to rear wheels),

$$k^2 \approx AB$$

Note that on many automobiles, $k^2$ is sufficiently close to the product $AB$ to produce yaw rotations about a point near the front wheel.

(Tire forces are neglected in the preceding analysis.)