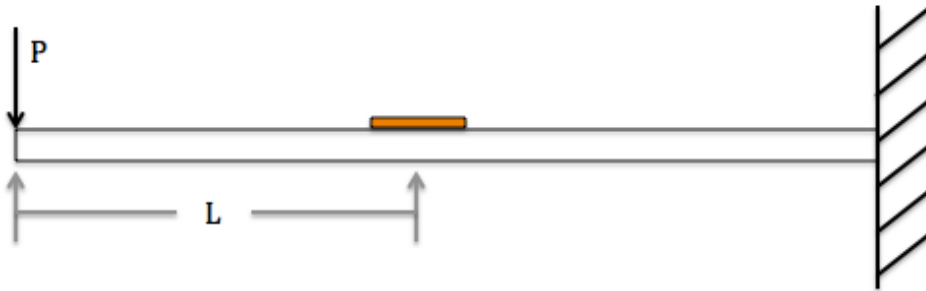


P16315
Gauge Accuracy Feasibility



Clamp test piece to perform tests.
Affix strain gauges a measured distance from the free end of the test piece.
Apply a load on the end of the clamped test piece (cantilevered beam model, shown above).
Calculate stress and strain as follows:

Determine moment using singularity functions:

$$q(x) = P\langle x \rangle^{-1}$$

$$M(x) = P\langle x \rangle^1$$

Where x is the distance from the free end of the test sample

Stress Calculations:

$$\sigma = -MC/I$$

Where C is one half of the beam thickness and $I = (1/12)bh^3$

Strain Calculations:

$$\varepsilon = \sigma/E = -MC/EI$$

Where E is Young's Modulus

If the calculations and the actual experiment yield results within 5%, this shows our gauge placement and calibrations to be accurate.