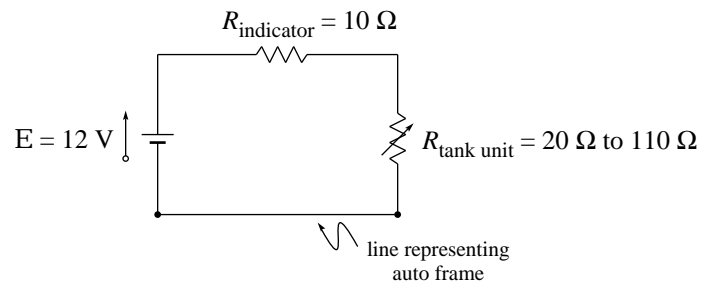


Automobile gas gauge



The current is $i = \mathcal{E}/R_{\text{total}}$ so

$$\begin{aligned} \text{full: } R_{\text{tank unit}} = 20\ \Omega \quad R_{\text{total}} = 30\ \Omega \quad \implies \quad i = 400\ \text{mA} \\ \text{half-full: } R_{\text{tank unit}} = 65\ \Omega \quad R_{\text{total}} = 75\ \Omega \quad \implies \quad i = 160\ \text{mA} \\ \text{empty: } R_{\text{tank unit}} = 110\ \Omega \quad R_{\text{total}} = 120\ \Omega \quad \implies \quad i = 100\ \text{mA} \end{aligned}$$

Grading: 1 point for free; 3 points for each part.