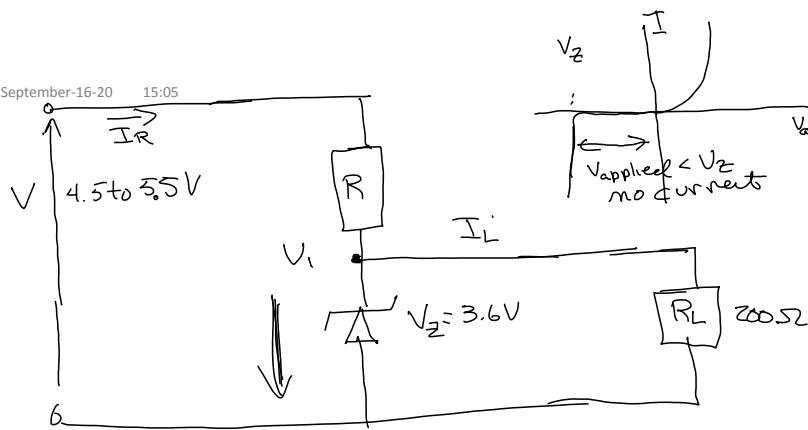




Make sure V_1 is always $\geq V_Z$

Smallest V_1 is when $V = 4.5$ V
at turn on all current is going through R_L

$$\text{at } V = V_{\min} \quad I_Z = 0 \\ V_1 = 3.6 \text{ V}$$

$$3.6 \text{ V} \leq V_1 = V_{\min} \frac{R_L}{R_L + R}$$

$$3.6 \text{ V} (R + R_L) \leq V_{\min} R_L$$

$$R \leq \frac{V_{\min}}{3.6 \text{ V}} R_L - R_L$$

$$R \leq \frac{4.5 \text{ V}}{3.6 \text{ V}} (200 \Omega) - 200 \Omega$$

$$R \leq 50 \Omega$$

When $R \leq 50 \Omega$, our minimum voltage of 4.5 V breaks down the Zener diode

So that as V increases from 4.5 V, V_1 stays at 3.6 V