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5 Chapter 14: Inductance

1. What is (a) the rate at which the current though a 0.50-H coil is changing if an emf of 0.150 V is induced across the coil?

$\Delta V = -L \frac{dI}{dt}$ $\frac{dI}{dt} = \frac{-0.150}{0.5} = -0.3\ A/s$

$|-0.3| = 0.3\ A/s$

2. When a camera uses a flash, a fully charged capacitor discharges through an inductor. In what time must the 0.100-A current through a 2.00-mH inductor be switched on or off to induce a 500-V emf?

$dt = \frac{((2.0)(10^{-3}))}{500}(0.100)$

$= 4 \times 10^{-7} s$

$\Delta V = L\left(\frac{dI}{dt}\right)$

$dt = \frac{L}{\Delta V} dI$

*time is positive