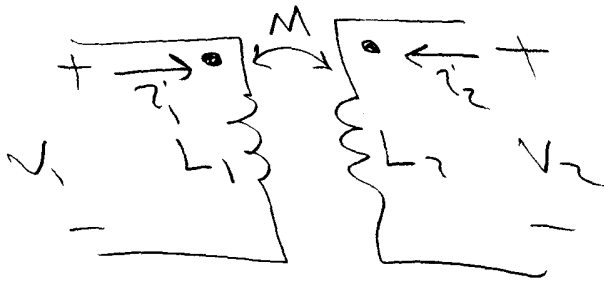


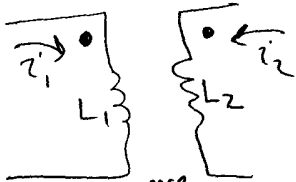
Energy Calculations?



what is the total Energy stored in the magnetically coupled coils?

$$w(t) = \underbrace{\frac{1}{2} L_1 i_1^2}_{\text{coil 1}} + \underbrace{\frac{1}{2} L_2 i_2^2}_{\text{coil 2}} \pm \underbrace{M i_1 i_2}_{\text{Mutual Energy}}$$

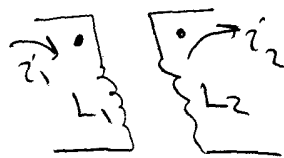
How to decide on the sign, "+" or "-" ?



i_1 and i_2 are same
Both enter the
Dot.

\Rightarrow "+"

$$\Rightarrow w(t) = \frac{1}{2} L_1 i_1^2 + \frac{1}{2} L_2 i_2^2 + M i_1 i_2$$



i_1 and i_2 are opposite
one current enters while
the other leaves.

\Rightarrow "-"

$$\Rightarrow w(t) = \frac{1}{2} L_1 i_1^2 + \frac{1}{2} L_2 i_2^2 - M i_1 i_2$$