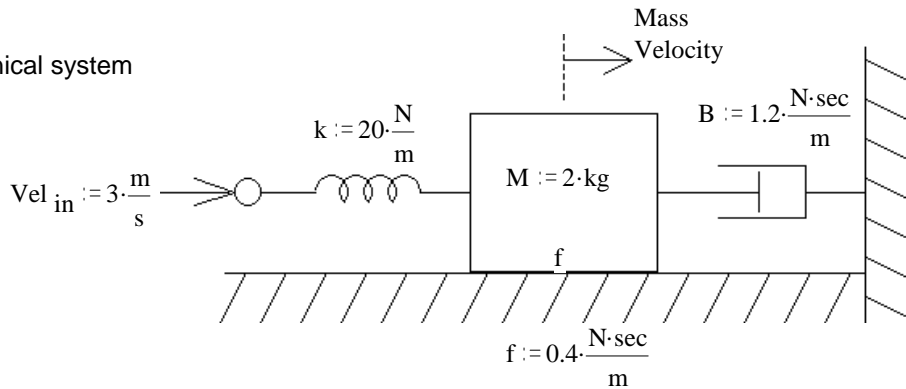
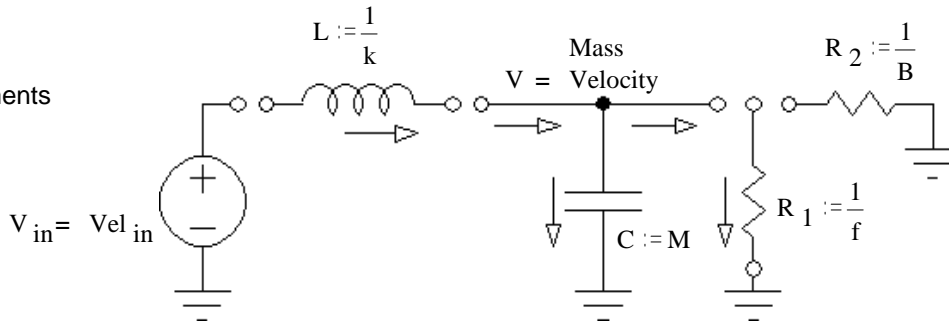


**Example 1**

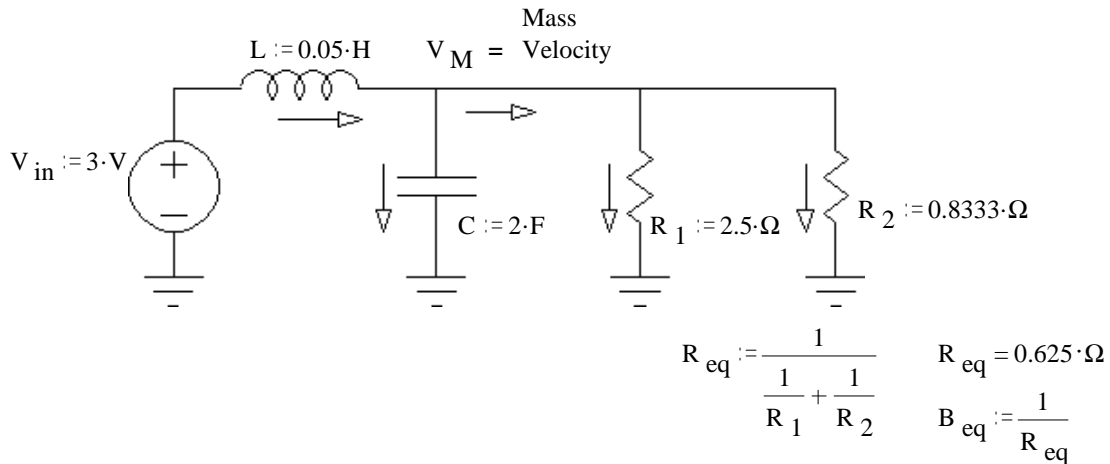
Mechanical system



Elements



Circuit



Transfer function

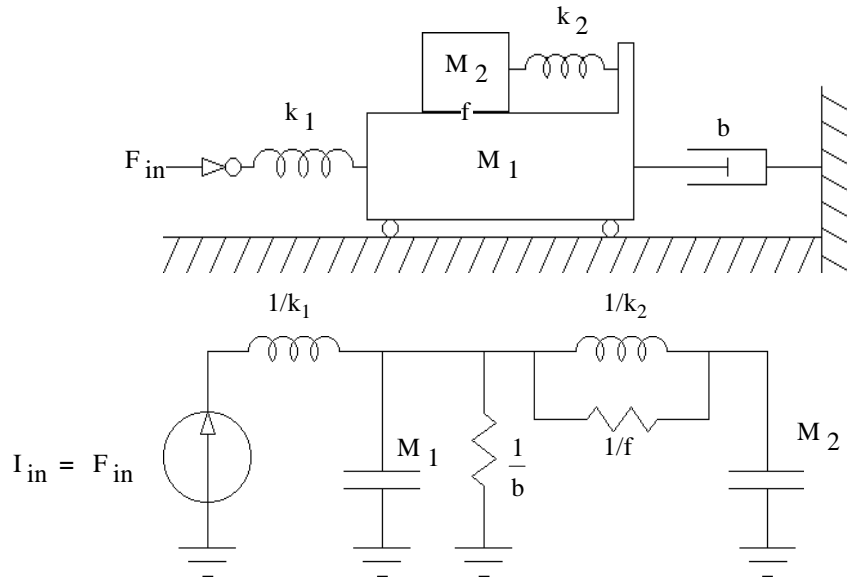
$$\frac{V_M(s)}{V_{in}(s)} = \frac{1}{C \cdot s + \frac{1}{R_{eq}}} \cdot \frac{\left( C \cdot s + \frac{1}{R_{eq}} \right)}{L \cdot s + \frac{1}{C \cdot s + \frac{1}{R_{eq}}}} = \frac{1}{L \cdot C \cdot s^2 + \frac{L}{R_{eq}} \cdot s + 1} \cdot \frac{\left( \frac{1}{L \cdot C} \right)}{\left( \frac{1}{L \cdot C} \right)} = \frac{1}{s^2 + \frac{1}{C \cdot R_{eq}} \cdot s + \frac{1}{L \cdot C}}$$

$$\frac{V_M(s)}{Vel_{in}(s)} = \frac{\frac{k}{M}}{s^2 + \frac{B_{eq}}{M} \cdot s + \frac{k}{M}} = \frac{\frac{20 \cdot N}{2 \cdot kg \cdot m}}{s^2 + \frac{1.6 \cdot N \cdot sec}{2 \cdot kg \cdot m} \cdot s + \left( \frac{20 \cdot N}{2 \cdot kg \cdot m} \right)} = \frac{10}{s^2 + 0.8 \cdot s + 10} \quad \text{same, either way}$$

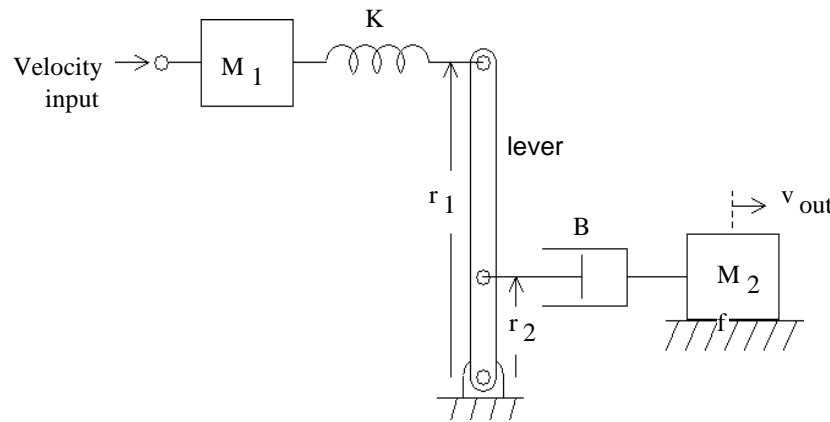
without units

**ECE 3510 Mechanical to Electrical Examples p.2**

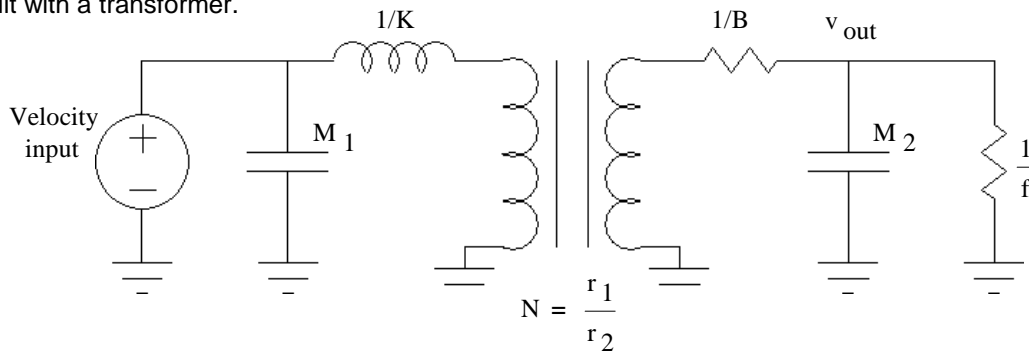
**Example 2**



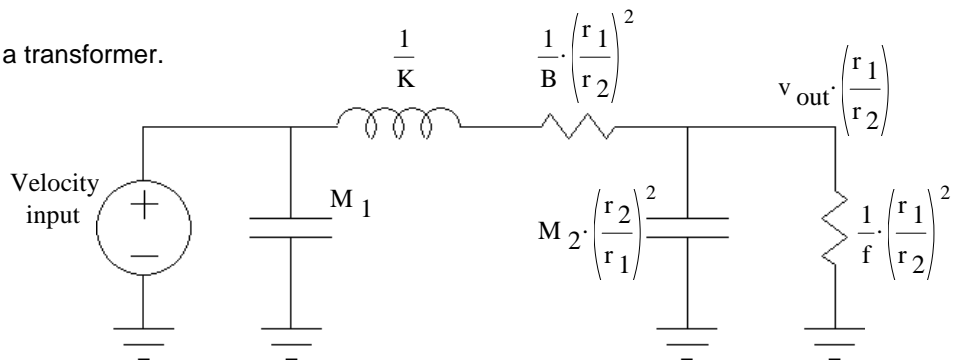
**Example 3**



Circuit with a transformer.

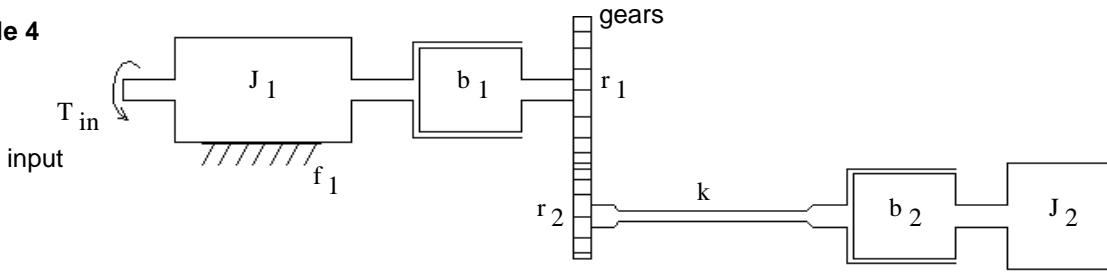


Circuit without a transformer.

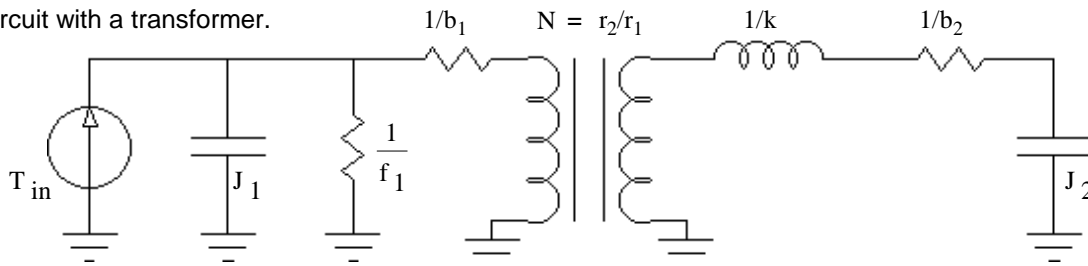


# ECE 3510 Mechanical to Electrical Examples p.3

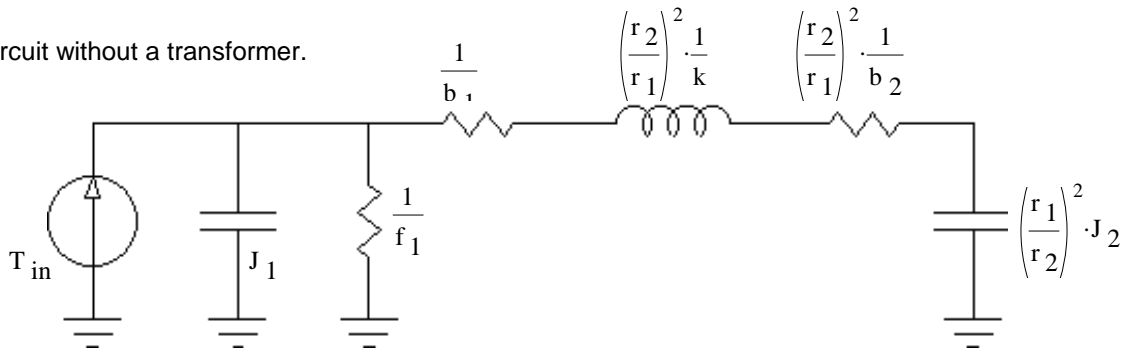
## Example 4



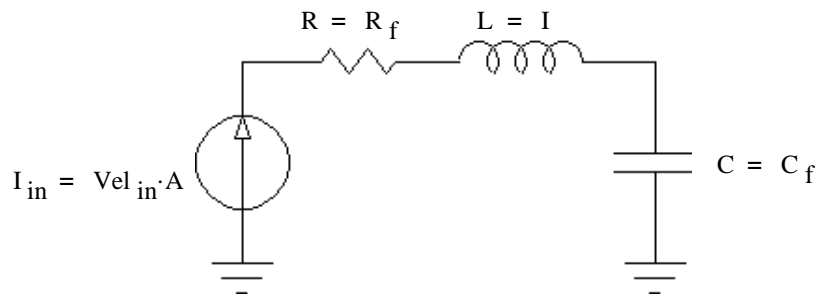
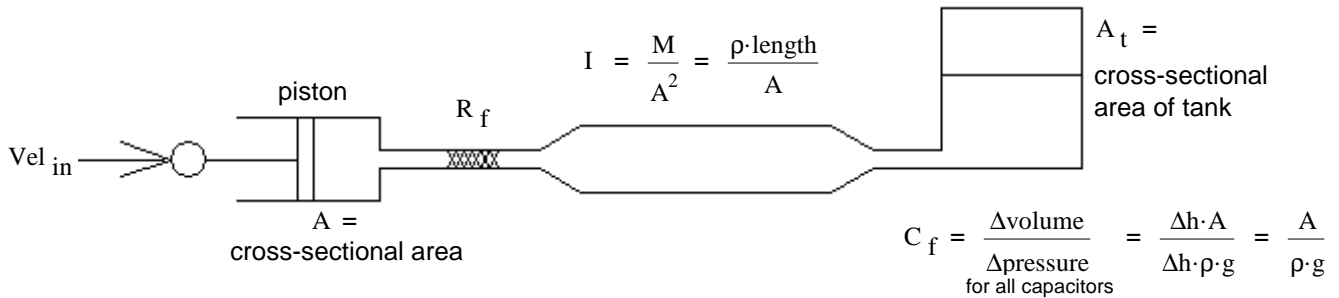
Circuit with a transformer.



Circuit without a transformer.

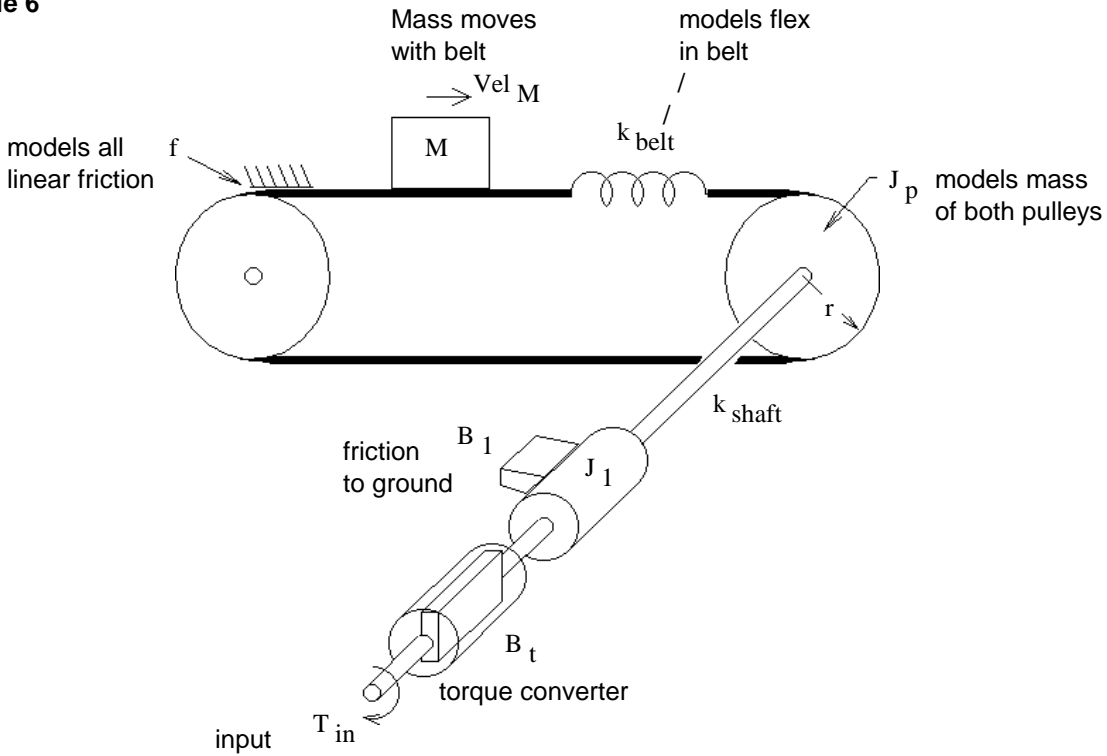


## Example 5, fluids

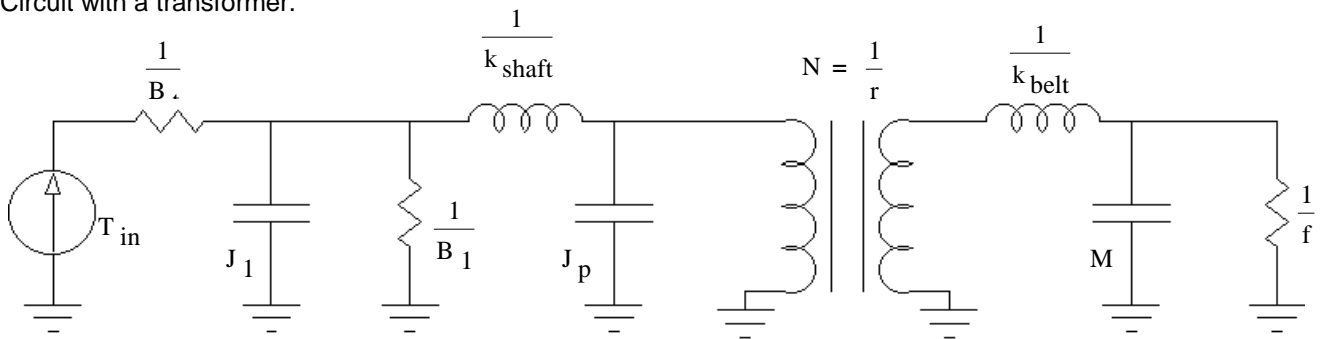


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## Example 6



Circuit with a transformer.



Circuit without a transformer.

