

Difference between Mechanical Energy (ME) conservation and Total Energy (TE) conservation:

So far we have looked at conservation of ME where there is no heat loss or friction.

$$ME = ME'$$
$$PE_g + PE_E + KE = PE_g' + PE_E' + KE'$$

In reality there is frictional heat loss and this is why there is efficiency. The final energy or Work Output (Wo) is less than the initial energy or Work Input (Wi). In these cases we use conservation of Total Energy (TE) which includes heat loss.

$$TE = TE'$$
$$ME = ME' + \text{Heat}$$
$$PE_g + PE_E + KE = PE_g' + PE_E' + KE' + \text{Heat}$$

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