

Answer on Question 75207, Physics, Other

Question:

What is the efficiency of a gasoline engine that receives 192.75 J of energy from combustion and lose 135.25 J by heat to exhaust during one cycle?

Solution:

We can find the efficiency of a gasoline engine from the formula:

$$\eta = \frac{Q_h - Q_c}{Q_h} \cdot 100\% = \left(1 - \frac{Q_c}{Q_h}\right) \cdot 100\%,$$

here, $Q_h = 192.75\text{ J}$ is the heat energy absorbed by the gasoline engine from the combustion, $Q_c = 135.25\text{ J}$ is the heat energy removed by the gasoline engine as exhaust.

Then, we get:

$$\eta = \left(1 - \frac{Q_c}{Q_h}\right) \cdot 100\% = \left(1 - \frac{135.25\text{ J}}{192.75\text{ J}}\right) \cdot 100\% = 30\%.$$

Answer:

$$\eta = 30\%.$$

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