7.20 When an 800 kg compact car accelerates from rest to 27 m/s it consumes 0.0606 L of gas, and 1.0 L of gas contains approximately 3.2×10^7 J of energy. What is the efficiency of the car?

$$K = \frac{1}{2}mv^2 = \frac{1}{2}(800\,kg)(27\,m/s)^2 = 291600\,J$$

$$E_{source} = 0.0606\,L\left(\frac{3.2\times10^7\,J}{1\,L}\right) = 1.94\times10^6\,J$$

$$\text{efficiency} = \frac{K}{E_{source}} = \frac{2.92\times10^5\,J}{1.94\times10^6\,J} = 0.15$$

15% efficient