

Answer on Question #49064, Engineering, Other

A car of mass 1000 kg is cruising at 90 km/hr. At this velocity the drag and friction forces that the engine needs to work against is equivalent to 250 N.

The propulsive power delivered at the wheels is equal to 6250 Watts. The mechanical efficiency of the wheel hubs and transmission driveline is given as 97%. The mechanical efficiency of the gearbox is given as 92%.

Q: Calculate the power that the engine needs producing in order to deliver a propulsive power at the wheels of 6250 Watts?

Give your answer in Watts

If the power of engine is P_{engine} , then the power transform between engine and wheels:

$$6250W = 0.97(0.92P) \rightarrow P_{engine} = \frac{6250W}{0.97 \cdot 0.92} \approx 7004W$$

Answer: $P_{engine} \approx 7004W$