

ENERGY-WORK-POWER

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Lamborghini Huracán LP 580-2 Is a Rear-Drive Dream, > \$200,000.00



INTRODUCTION: Power output (useful power to the wheels) divided by Power input = efficiency X
Power output P_{OUT} goes into Work W_{OUTPUT} / time.
 W_{OUT} goes into kinetic energy at the wheels = $\frac{1}{2} m v^2$.
Thus, $P_{\text{OUTPUT}} = P_{\text{IN}} X = [\frac{1}{2} m v^2] / t$

$$X = m v^2 / 2 P_{\text{INPUT}} t$$

QUESTIONS: (a) Lamborghini site says weight = 3400 lb. Find mass(in slugs) of the Huracan., (b) Consider the final speed is 0 – 62 mph (in Lamborghini site)in 3.4 s. Convert 62 mph to ft./s.? (c) Convert 580 HP to ft. lb./s. (d) Find efficiency X of the Huracan? (e) Comment?

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LEGEND has it that in the early 1960s, Ferruccio Lamborghini, an Italian tractor maker, thought the Ferrari sports car he owned could be improved. But his suggestions to the car's designer, Enzo Ferrari, were rebuffed. Thus began a rivalry, as Mr. Lamborghini entered the performance-car business, resulting in some stunning art and engineering. But Ferruccio didn't just compete with Enzo out of spite. Mr. Lamborghini was enough of an industrialist that he figured repurposed parts would be a way to achieve manufacturing efficiencies. That philosophy remains, as evident in Lamborghini's newest way to risk losing your driver's license: the Huracán LP 580-2. The car is a rear-wheel-drive version of the Lamborghini 4-wheel-drive LP 610-4. And the **new car's V10 pumps out 580 horsepower**, compared with the 610's — you guessed it — 610 horses. And keeping things in the family, the Huracán uses the same aluminum and carbon-fiber chassis that used for the [Audi R8](#). (Yes, like Audi, Lamborghini is owned by Volkswagen.) LP stands for longitudinal posterior, and the final digit represents how many wheels propel the car. Oh, and so that you can sound extra cool at the next cocktail party, the dash in the name is spoken. So it's "five eighty dash two." Why ditch the 610's all-wheel drive and its ability to maximize traction and lap times? Emotion. The 580 is all about getting the tail to break away in a controlled manner. To be sure, inducing oversteer on public roads with a car as capable as Huracán is a bad idea. But certainly the rear-drive essence can be felt. In a straight line, Lamborghini claims **Huracán howls to 60 miles per hour in 3.4 seconds**. ([Lamborghini web site states 0 – 62 mph in 3.4 s.](#)) Huracán can be a daily driver. Starting at around \$200,000 including the gas-guzzler tax, the 580-2 is Lamborghini's most affordable model. As tested, it's \$221,000.

HINTS: weight = mass X gravity = $m g$, $g = 32 \text{ ft./s.}^2$, $88 \text{ ft./s.} = 60 \text{ mph}$, $550 \text{ ft. lb. / s.} = 1 \text{ HP}$

ANSWERS: (a) $m = 106.25$ slugs, (b) $v = 90.933 \text{ ft./s.}$, (c) $P_{\text{INPUT}} = 319,000 \text{ ft. lb./s.}$, (d) $\sim X = 40.5 \%$ efficient
(e) Lamborghini owned by VW(as with a Audi) high efficiency would be in order....as we have here.