

ENERGY, WORK, POWER

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Cadillac CT6 Adds ‘Sporty’ to the Luxury Lexicon



INTRODUCTION: This twin turbo engine output power (P_{OUT}) goes into doing (output work/unit time) where $W_{OUT} = \text{Useful kinetic energy} = \frac{1}{2} m v^2$. Thus $P_{OUT} = \frac{1}{2} m v^2/t$
 $X = \text{efficiency} = P_{OUT}/P_{input}$, **$X P_{INPUT} = \frac{1}{2} m v^2/t$**
At Wikipedia weight of CT6 is listed at 3831 lb.

QUESTIONS: (a) Find mass of CT6? (b) Convert CTS HP to ft. lb./s.? (c) Find efficiency X of Macon?, (d) Does this efficiency seem reasonable for a twin-turbo?

HINTS: weight = (mass) g , $W = mg$, $g = 32 \text{ ft./s.}^2$, $60 \text{ mph} = 88 \text{ ft./s.}$, $550 \text{ ft. lb./s.} = 1 \text{ HP}$

ANSWERS: (a) $m = 59.85 \text{ slugs}$, (b) $P_{INOUT} = 222,200 \text{ ft. , lb.}$,
(c) $X = 0.417$ or 41.7 % efficient, (d) Twin turbos normally are 40 % efficient. So, our understanding of: work. energy, power is valid. jc

Cadillac? It could be anything. Tail fins. Comfort. Pink. Cimarron. Really, it's time to let that last one go — it's been nearly 30 years.

Cadillac is a different company from what it was even 10 years ago and the 2017 CT6 is a perfect example. Fins, seasickness and the blatant lineage to lesser General Motors products have been banished. If there is a brand that premium buyers overlook, this is it.

Meant to rival Audi A8, BMW 7 Series and Mercedes S-Class, the CT6 is more affordable, in some cases by over \$25,000 when comparably equipped. Starting at \$54,790, my tester, a loaded all-wheel-drive Platinum model that cracked \$91,000, can be considered the bargain of the segment, unless it's compared with the Genesis G90.

The base rear-wheel-drive CT6 comes with a turbocharged 2-liter 4-cylinder (not a typo) engine. The plug-in hybrid model travels about 30 miles on electricity alone before switching over to gas/electric operation. **There is a 3.6-**

liter V6, too. I'm driving the twin-turbo 3-liter V6 with 404 horsepower and 400

pound-ft of torque. It is a \$4,000 premium over the nonturbo V6. **The turbo V6 propels this luxury liner from rest to 60 miles an hour in five seconds flat.** The Environmental Protection Agency rates this engine's fuel economy at 18 miles per gallon in the city and 26 highway. A cocoon of silence keeps the faint engine snarl distant. The CT6's stout chassis structure uses a lot of aluminum. A lighter car is a faster car.