ENERGY-WORK-POWER

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Porsche 911 Redesign Is Revved Up

Driven | Porsche 911 Carrera S Cabriolet

INTRODUCTION: **Goal is to find efficiency X of this 2017 Porsche Cabriolet. $X = P_{OUT}/P_{INPUT}$ Power Output = $P_{OUT} = W_{OUT}/t$, W_{OUT} = goes into useful kinetic energy at wheels = $\frac{1}{2} m v^2$**

$$P_{OUT} = X P_{IN} = [\frac{1}{2} m v^2]/ t$$

$$X = [\frac{1}{2} m V^2]/ P_{IN} t \qquad \text{eq. 1}$$

At Porsche web site weight = 3400 lb.

HINTS: **m g = weight , g = 32 ft./s.^{2}**
60 mph = 88 ft./s., 1 HP = 550 ft. lb./s.

QUESTIONS: **see below**

The 2017 Porsche 911 gets some light tweaking on the outside and big changes to the power plant: All models are now **turbocharged.** Watch in Times Video » PORSCHE 911 owners are a faithful and rabid bunch who do not like their car to be messed with. In the late 1990s, when the people in Stuttgart switched from air-cooled **to water-cooled engines**, loyalists were certain the move caused the financial collapse in Southeast Asia and tsunamis in Papua New Guinea. Perhaps even that dreadful movie "Armageddon." It could be déjà vu all over again. With the 2017 model year, **all 911s are now turbocharged**. The twin-turbo version of the flat-6 engine is smaller now at 3 liters and more fuel-efficient. **It also packs additional((horsepower — 420))** in the Carrera S Cabriolet model I drove, which drinks premium fuel at a rate of 20 miles per gallon city, 28 highway, according to the government. The 7-speed PDK dual-clutch automatic gearbox is a brilliant piece of machinery. Both transmissions are redesigned. A **starting price of $90,450 for a base hardtop coupe** will save most of us from having to choose between the two**. As tested, the Cabrio just clears $135,000.**

Manual 911s **(((dash from standstill to 60 miles an hour in about 4 seconds))),** while the PDK — which stands for Porsche Doppelkupplung, not Pretty Darn Kwik — is a couple of ticks faster. Sonically, the 911's precision clockwork-on-amphetamines characteristic remains, save for a whisper of a whistle added by the turbos that should be a deal breaker only to those sensitive to ultrasonic dog whistles. That symphony of mechanical delight is deliberately guided into the cabin.

QUESTIONS: **(a) Find mass in slugs of this Porsche? (b) Find the input horsepower P_{OUT} = ? , (c) Find efficiency X of this Porsche 911 turbo?**

ANSWERS: **(a) 106.25 slugs, (b) 231,000 ft. lb. /s., (c) ~ 44.5 % .....typical efficiency of twin-turbos.**

COMMENT: **This new Porsche 911 has rear air intake that gulps MORE air for it's TWIN-TURBO making the engine more fuel-efficient as said in the New York Times article.**