

# WORK-ENERGY-POWER

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**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 Macon is listed at 4173 lb.

**QUESTIONS:** (a) Find mass of Macon? (b) Convert Macon HP to ft. lb./s.? (c) Find efficiency X of Macon?

**HINTS:** Wt. = m g , g = 32 ft./s.<sup>2</sup> , 550 ft. lb./s. = 1 HP

**ANSWERS:** (a) 130.56 slugs , (b) 187,000 ft. lb./s., (c) ~54%  
**COMMENT:** Being a twin turbo, we should expect > 40% X.

## Macan S 2016, a Lively Crossover From Porsche

Smaller than the company's Cayenne S.U.V., the Macan proves that compact crossovers can be more than just When [Porsche](#) added the Cayenne sport utility vehicle to its lineup in 2003, loyalists reacted as if Beelzebub himself would ride in to usher in doomsday. Funny how it became the best-selling vehicle the company makes.

This encouraged the executives from Stuttgart to produce a smaller crossover, the Macan. Porsche says **Macan is the Indonesian word for tiger**, which is more exotic than the German word — tiger. It's also an improvement on the name many expected — [Cajun](#). More petite than the Cayenne, Macan is chuckable fun with the feel of a rear-drive car. The S model tested goes from **((0 to 60 miles an hour in five seconds flat.))** The brakes are stout, and tire grip is sticky and predictable. Shifts from the 7-speed PDK dual-clutch gearbox make eye blinks seem slow.

These lofty capabilities that keep drivers out of trouble are also the kind to lure them north of the speed limit. A practical all-wheel-drive S.U.V. that performs like a sport sedan makes one giggle. Base Macans get a turbocharged 4-cylinder. The **S models get more spunk in the form of a ((3-liter twin turbocharged V6 with 340 horsepower))** and 339 pound feet of torque. (The Turbo model bumps power up even more.)

The Macan returned about 17 miles for every gallon of specified premium fuel under my hard right foot. The government rates it at 17 city and 23 highway. The back seat can be summed up with the phrase "two's company, three's a crowd." It's comfortable for a couple, and the seat backs drop 40-20-40. A **base Macan starts at \$48,550**. Smothered in options like a panoramic glass roof and upgraded wheels, my S model tester closed in on \$71,000. The Macan is not a budget-minded appliance; it's about wringing high performance out of a practical shape.

