

WORK-ENERGY-POWER

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The Volvo S90 Is Very Swedish, and Very Appealing



INTRODUCTION: The purpose of this application is to find efficiency X of this turbocharged Volvo S90 sedan 2017.

Output Power $P_{\text{OUTPUT}} = X P_{\text{INPUT}} = \text{Work}/\text{time} = W/t =$

$$[1/2 m v^2]/t = X P_{\text{INPUT}} \quad \text{eq. 1}$$

Output work (actual energy passed on to wheels) goes to cars kinetic energy $\frac{1}{2} m v^2$.

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

QUESTIONS: (a) Find mass in slugs of this Volvo S90 2017? Weight of Volvo S90 is 4222 lb. (b) Convert 316 HP to ft. lb./s. ? (c) Use equation 1 to find this cars efficiency X ? Take time of 5.7 s. to accelerate from 0 – 60 mph from motortrend.com.

ANSWERS: (a) 131.94 slugs , (b) 173,800 ft. lb./s. , (c) ~ 51.6 %

Chinese investment in the company has produced the most Swedish Volvos ever. And in the case of the S90, it helps it compete against established luxury brands CHANGE in the auto industry is merciless. In 2010, Volvo was sold to the Zhejiang Geely Holding Group, a Chinese company. Somehow, Chinese investment has produced the most Swedish Volvos ever. Skoal! Looking more Scandinavian than a trip to Ikea, the all-new S90 sedan starts with a solid foundation. Volvo's SPA vehicles in the United States use one gas engine for now — a 2-liter 4-cylinder. Buy a T5 model and it's turbocharged and has front-wheel drive. **The tested T6 adds supercharging to the turbo for 316 horsepower** and 295 pound-feet of torque on specified premium fuel. It also grips with all-wheel drive. Both the T5 and T6 employ an 8-speed automatic transmission. A coming T8 plug-in hybrid version adds an electric motor for even more power and efficiency. Drop the throttle and T6 power moves the S90 like a Viking. **The driving system reads the road stripes and traffic ahead and then controls the throttle, brakes and steering.** Leave your hands off the wheel for more than 10 seconds and it scolds you to remain fully engaged. Pilot Assist operates at speeds up to 80 miles an hour, but be careful — it won't pay your speeding ticket. Those who own an XC90 with the first-generation Pilot Assist system can have it upgraded for a small charge. Wagon fans will want to wait for the V90 Cross Country being released later this year. It's quite an adjustment to think that Volvo might be known for luxury and style over safety features. But if the company keeps releasing vehicles like this, that seems bound to happen. Of course, at **\$66,105** as tested (T5 prices begin at \$47,945), this is not the kind of car for everyone. But it is certainly a sign of change — and welcome change, at that.