

# WORK-ENERGY-POWER

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## Lexus Adds a Few Twists to the New RX350



**INTRODUCTION:**  $P_{\text{OUTPUT}}/P_{\text{INPUT}} = X = \text{efficiency}$ ,  
 $P_{\text{OUT}} = X P_{\text{INPUT}} = W_{\text{OUT}}/t = [1/2 m v^2]/t$  eq. 1

$W_{\text{OUTPUT}}$  = useful work of engine goes into Kinetic energy ( $K = 1/2 m v^2$ ) of car. At the Lexus site: [YourLexusDealer.com](http://YourLexusDealer.com) the weight RX350 is 4300 lb.

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

**QUESTIONS:** (a) Find mass (in slugs) of this car? (b) Find  $P_{\text{INPUT}}$  in ft. lb./s.?, (c) Find efficiency X ?

**ANSWERS:** (a) 134.4 slugs , (b) 162,250 ft. lb./s.  
(c) 0.43 or 43% efficient

The **new generation of the best-selling vehicle in the brand's lineup** gets a bold, angular look, a gutsy move considering that the RX helped build Lexus. Luxury crossovers see little off-road duty, but they have helped automakers find the pot of gold at the end of the rainbow — none more so than Lexus, which invented the lucrative segment with the RX. **It has long been the brand's best seller.** Cruise any upper-middle-class neighborhood and you would swear RXs are given as housewarming gifts. Like its predecessors, the new RX is sold with a 3.5-liter V6 (the RX 350) and a **hybrid powertrain** (the RX 450h). The fourth generation is longer by nearly five inches; the cabin is a bit wider. The **(((V6 produces 295 horsepower** and 267 pound-feet of torque higher in the rev range. All-wheel-drive **RX350s do the dash from 0 to 60 miles an hour in about 7.5 seconds)))**. Available in front- and rear-wheel drive, the F Sport with its **8-speed transmission uses data from G-force sensors to know when to hold gear ratios while cornering.** With standard grade gas, the RX350's fuel economy is about par with the competition, rated by the federal government at 19 miles per gallon in the city and 26 on the highway.