

WORK-ENERGY-POWER

Unit 10 & 11 Dr. John P. Cise, Professor of

Physics, Austin Com. College, 1212 Rio Grande St., Austin Tx. 78701 jpcise@austincc.edu & NYTimes Feb. 12, 2016 by Tom Voelk

With the RC F, Lexus Abandons Its Beige Image



INTRODUCTION: Power output (P_{OUT}) / Power input (P_{IN}) = EFFICIENCY (X) . $X P_{IN} = W_{OUTPUT} / t = [1/2 m V^2] / t$

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

QUESTIONS: (a) Find mass (in slugs) of car?
(b) Convert Input horsepower 467 HP to ft. lb./s.?
(c) Find RC F Lexus efficiency X ? (d) Comment on X?

ANSWERS: (a) 123.7 slugs , (b) 256,859 ft. lb./s.,(c)~42%
(d) Being a traditional engine(not turbo), X is amazing !

Lexus has made its name as a luxury brand, but it also makes some performance cars, like the RC F. The coupe is powered by a sonorous V8 that propels it **to 60 miles an hour from a standstill in 4.4 seconds.** And lo, the engineers have delivered the RC F. With plenty of oomph from its 5-liter V8 engine, rear-wheel drive, all wrapped in a two-door coupe, the RC F ventures into territory defined by the Camaro SS and Mustang GT. To find **467 horsepower** (P_{INPUT}) and 389 pound-feet of torque throbbing under the aluminum hood of a Lexus is heartening. Cars often share an architecture; RC is hewn from three of them. The front structure springs from the GS, the midfloor pan is courtesy of the IS convertible, and the rear is from the IS sedan. The F model adds chassis bracing, welds and adhesives for structural stoutness. **Lexus claims a 4.4-second sprint from 0 to 60.** Road warriors will appreciate the F's communicative electric power steering but may lament the lack of a manual gearbox. An 8-speed automatic is impressive — and mandatory. RC F's performance is daydream fodder. Reality's cold water reminds drivers that it's tough to employ the full heroic power and handling of cars in this class on public roads (safely, anyway). On a track, the RC F has a disadvantage. Weighing 258 pounds more than the Cadillac ATS-V and 373 pounds more than the BMW M4, the Lexus is a sumo in Spanx. It's **weight is 3958 lb.** from the Lexus site.