POWER(OUTPUT) =$WORK_{OUTPUT}$ /TIME= F x/t = F v

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Sam Wheeler, Land Speed Racing Pioneer, Dies at 72

Sam Wheeler died after a single-vehicle crash at the Bonneville Salt Flats in Utah on Monday. He was test-driving his land speed motorcycle.

INTRODUCTION: The power needed to attain speed is P = F v. Where F is the force forward ON on motorcycle. F is equivalent to ALL frictional forces (f) BACKWARD on motorcycle. Aerodynamic (due to air friction) friction is much more dominant compared to rolling friction at high speed. $f_{AIR} = Cv^2$ Thus, $P = C v^3$ C = constant In the article below 275 HP was needed to go 350 mph.

QUESTIONS: (a) Convert 275 HP to ft. lb./s. ? (b) Convert 350 mph to ft./s.? , (c) Find constant C? , (d) Convert 400 mph to ft./s.?, (e) Find power needed to attain 400 mph In ft. lb./s. & HP? (f) Find % power increase needed to Increase speed from 350 mph to 400 mph? (g) Comment on answer (f) ? CONTINUED BELOW

Sam Wheeler, a renowned land speed motorcycle racer, died on Monday after a racing accident at the Bonneville Salt Flats in Utah. He was 72. **(((Wheeler was going about 200 miles per hour during a test run)))when the back of his streamliner motorcycle started fishtailing,** said Mike Cook, the event organizer who witnessed the incident. Wheeler's motorcycle began to slide and then popped into the air and came crashing down on the caged section where Wheeler was seated, Cook said. Wheeler was alive when emergency crews extracted him, but he died about four hours later at Intermountain Medical Center in Murray, Utah. Wheeler, an engineer from Arcadia, Calif., was known as a pioneer in the sport of land speed racing. **(((He spent more than two decades building, fine-tuning and racing a motorcycle on which he reached speeds exceeding 300 mph))),** said Pat McDowell, a fellow racer and friend.

Wheeler's engines: Hayabusa Powered Drivetrain: Despite its long association with Kawasaki, the redesigned E-Z-Hook streamliner switches over to Suzuki's Hayabusa engine. The ZX-11 ruled the roost in 1990 as Wheeler prepped his streamliner up for its first runs, but the mighty Hayabusa has since taken over the LSR scene (see sidebar). Wheeler experienced Busa power firsthand in the Ack Attack streamliner (designed by his friend and riding buddy Mike Akatiff and which sources a pair of Hayabusa engines), when Wheeler served briefly as pilot before Robinson took over for good in 2006. Though the 275-horsepower ZX-11 was able to hit 350 mph on more than one occasion, for a serious 400 mph attempt Wheeler deemed a power upgrade necessary. Vance & Hines has stepped up to provide the Haybusa engine, with Byron Hines himself supervising the build from the company's Indiana race shop. V&H brings ample NHRA drag racing experience to the table and can get close to 500 horsepower even without turbocharging. Terry Kizer (AKA Mr. Turbo), who built the original ZX-11 motor, returns to turbocharge the V&H Busa mill. MoTeC provides the electronics, and the new E-Z-Hook will benefit from traction control to harness the prodigious power on tap. All told Wheeler reckons the new engine should approach 600 hp.

HINTS: HP = 550 ft. lb./s. , 60 mph = 88 ft./s. ,

ANSWERS: (a) 275 HP = 151,250 ft. lb./s. , (b) 350 mph = 513.33 ft./s., (c) C = 0.00111814 lb. $s.^2$/ $ft.^2$ (d) 400 mph = 586.67 ft./s. , (e) P = 225,772.17 ft. lb./s. or 410.5 HP , (f) +49.3 % increase in power needed to increase speed from 350 mph to 400 mph., (g) Increasing speed from 350 to 400 mph is a 14.3 % increase in speed, but note since power needed is proportional to cube of speed the power needed must increase by almost 50% (49.3%).