

Forbes

Son of Wankel

How to get 51mpg from an engine the size of a Thanksgiving turkey.

By Christopher Steiner

YOU WANT TO SAVE THE EARTH, but you're not ready for a hybrid car. The four-cylinder gasoline engine in the new Toyota Corolla is about as efficient as it gets, producing 130hp and 41 highway miles per gallon. With plastic intake manifolds and head-mounted injectors, it weighs a scant 234 pounds. But what if you could get the same horsepower and 10mpg more from an engine that weighs half as much and could fit under a rear seat cushion? This is the promise of the rotary engine, a century-old technology that stalled two decades ago but may rev again.

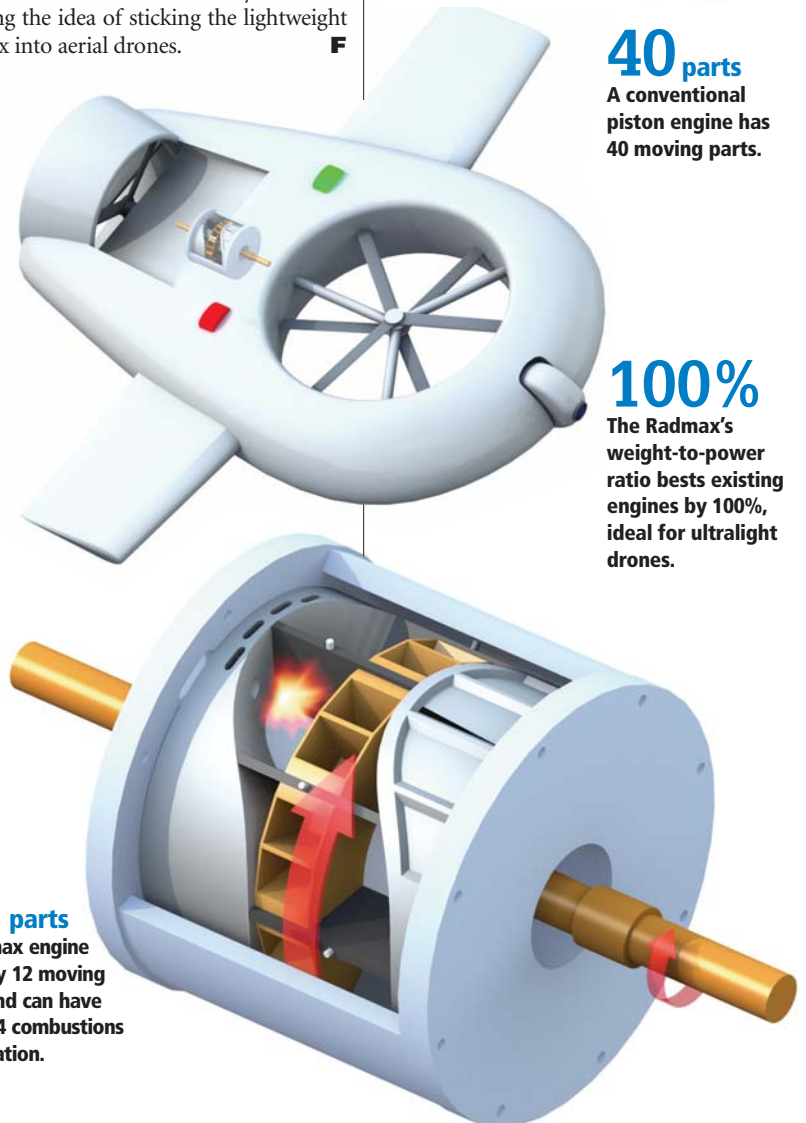
Conventional four-stroke engines produce power by moving a piston up and down using rapid explosions of fuel and air in a cylindrical chamber. A rotary engine has no pistons. The Wankel engine in the Mazda RX-8 houses a rapidly spinning cam that is shaped to compress and combust fuel and air against the inside of an oval chamber. A new take on the rotary comes from a tiny company in Vancouver, B.C., called Reg Technologies. Its Radmax engine uses two wave-shaped cams that rotate above and below a stationary rotor. The cams' curved surfaces compress fuel and release exhaust as they spin, generating 24 combustions for each crankshaft revolution. A water-cooled Radmax engine, so claims Reg, weighs 1 pound per horsepower. A water-cooled Wankel weighs 2 pounds per horsepower.

Rotary engines for years suffered emissions problems that were caused by leaky seals as the cam rotated. Reg says the Radmax's design eliminates leaks. Testing on a 125hp diesel engine is scheduled to begin soon. But getting the Radmax to market may be a challenge. The company has a dubious aroma to it: past ties to the Jehovah's Witnesses and appearances in the lists of stocks hyped by spammers. The 25-year-old Reg still has no revenue and has lost \$8 million

since it began work on its rotary 20 years ago. Its volatile shares, traded on the Toronto Stock Exchange, recently sold for 43 cents.

Reg says it's been approached by Rolls-Royce, Honda and Boeing, but its hopes currently rest with the U.S. military, which is pursuing the idea of sticking the lightweight Radmax into aerial drones. **F**

12 parts
A Radmax engine has only 12 moving parts and can have up to 24 combustions per rotation.



Technology
ROTARY REDUX



40 parts
A conventional piston engine has 40 moving parts.

100%
The Radmax's weight-to-power ratio bests existing engines by 100%, ideal for ultralight drones.