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The Wankel KKM motorcycle: The "A" marks one of the three apices of the rotor. The "B" marks the eccentric shaft, and the white area is the lobe of the eccentric shaft. The shaft turns three times for each rotation of the rotor around the lobe and once for each orbital revolution around the eccentric shaft. (Picture courtesy of Wikipedia.)

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The Wankel engine's geometry results in excessive crankshaft deflection at high engine revs due to the centrifugal force of the rotor which is eccentric to the crankshaft. This results in a low rotational speed limit.

The Szorenyi Three-Chamber Rotary Engine Concept

The Reuleaux triangle in the diagram represents the rotor of a Wankel rotary engine. As the rotor turns in the engine housing, the three vertices of the triangle stay in constant contact with the walls of the housing. Due to the shape of the engine housing, the size of each of the three chambers created by the rotor changes as the rotor rotates.

Chapter 10 : Circles : Reuleaux Polygons and the Wankel Engine

With the Wankel-type rotary engine, the rotor's apices follow the oval contour of the inner periphery of the engine casing while remaining in contact with the gear on the output shaft which is also in eccentric orbit around the center point of the engine casing. A phase gear mechanism dictates the orbit of the triangular rotor.

Chapter Structure and Working Principles

The unique sealing geometry of the X engine has 3-5 times less blowby than the Wankel rotary. This is mainly because 1) the Wankel requires clearance at the corners between its side/face seals and its apex seals, while the X engine does not; and 2) the Wankel seals traverse across holes that contain spark plug(s), whereas the X engine does not.

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The stator of the Szorenyi engine is a similar shape to a Wankel engine. However, the geometric shape of the engine rotor is a rhombus, which deforms as it rotates inside the contour of the mathematically defined stator. This geometry translates to a rotary engine with four combustion chambers.

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Wankel completed his first design of a rotary-piston engine in 1954, and the first unit was tested in 1957. In other internal-combustion engines, moving pistons did the work of getting the...

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