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## New engine technology air sealing

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The new technology uses air sealing in lieu of conventional mechanical sealing, and is designed for (a) Horizontally-Opposed/Scotch-Yoke (H-O/S-Y) piston engines, and (b) Twin-Wedge Oscillating and (true) Rotary engines, where the pistons/ rotors are positively and accurately located, such that they do not touch their mating components, but maintain a tiny clearance between them. It is fully realised that air sealing will not provide a perfect seal, but the technology also recognises that perfect sealing is not required as the higher compression-ratio and induction air-pressure compensates for the (small amount of) by-pass gases. The technology is designed to permit lighter, lower, quieter reduced-cost and more-compact engines. Using air-sealing, there is virtually no friction between the primary mating components, with no lubrication required, no wear, and thus provides an ultra-long service life. It uses a labyrinth of grooves, which are skilfully-designed to most-efficiently generate extremely high-speed eddy currents of the air, so as to provide effective sealing. Advantages of air-sealing include: providing a pressurised stratified-charge air-fuel mixture for improved combustion; providing an effective after-burn; providing higher fuel economy and higher (thermal, mechanical and volumetric) efficiencies; providing significantly lower friction; allowing for a liquid and air “minimal-cooling” system; continually cleaning internal components, especially spark-plugs and fuel injectors; significantly reducing all four harmful emissions; and requiring a less-powerful (air-operated) starter motor; A turbo-charger or super-charger, and a standard electronic fuel-injection system, are used. While conventional cylinder-heads and poppet valves can be used with H-O / S-Y piston engines, the overall performance is further enhanced by the use of rotary inlet-only valves. The inlet valves have only (relatively) cool air, rather than extremely hot exhaust gas, passing through them; hence the severe problems of sealing-efficiency, lubrication, and excessive wear with rotary exhaust valves are eliminated.

## Biography

After graduating in Australia in 1966, Colin commenced his automotive engineering career, specialising in engine design and development, high-performance, emissions, and alternative fuels. After two years, he was awarded a scholarship to continue his engineering education and work experience at a major automotive research centre in the U.S.

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