



# New Engine Technology – High Efficiencies - Low Emissions - Low Fuel Consumption

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*The technology is designed to provide significant “GREEN”, technical and financial advantages for automotive and aircraft engines*

MELBOURNE, VICTORIA, AUSTRALIA, March 3, 2014 /EINPresswire.com/ -- Dynex Automotive R&D is developing new engine technology for the automotive and aircraft use.

The technology is designed to provide significant “GREEN”, technical and financial advantages:

- Ultra-low exhaust emissions; significantly improved fuel economy;
- Low friction; on prime mating components, no lubrication required, no wear, ultra-long life;
- Higher efficiencies - mechanical, volumetric & thermal;
- Lighter and more compact engines.

The technology has patent protection. Licensing rights are being discussed with a number of parties who are interested in completing the development, and then marketing the technology Internationally.

The two phases are: Scotch-Yoke piston engines, and Oscillating/Rotary twin-wedge engines.

The technology uses “air-sealing” to replace piston/rotor sealing rings... on engines where the pistons/rotors are physically located so as not to contact their mating cylinder/housing surfaces.

The answer to the first Devil's-Advocate question is: “Of course you are right... it will not completely seal the gases, but it does not have to! The advantages far out-weigh the perceived disadvantages!”

Other significant features of the new technology are:

- provides a stratified-charge air-fuel mixture for combustion,
- provides an “after-burn” of exhaust gases,
- lowers the possibility of engine seizure,
- prevents over-heating of internal engine components,
- requires a less-powerful (air-powered) starter motor,
- continually cleans spark-plugs and fuel injectors,
- inherently super-charges the induction air,
- permits a smaller coolant system,
- permits the efficient use of “regenerative braking”
- provides quieter and smoother engine operation, and reduces the manufacturing and servicing cost of engines.

The compressed air, which is stored and continually replenished, performs the following functions:

- Seals (the induction air and combustion gases)
- Cools (all mating surfaces)

- Cushions the combustion
- Powers the small/compact starter-motor
- Powers other ancillary components

In lieu of mechanical piston rings or seals, the invention uses a labyrinth of grooves. The labyrinth consists of a number of grooves, which are angled toward the combustion chambers they are intended to seal. The cross-sectional shape and size of the grooves, and the number of grooves, are designed so as to most efficiently generate extremely high-speed eddy currents of the air, so as to provide effective sealing. Typically, the bottom of the grooves are semi-circular.

The moving elements of the engines (pistons) and their mating cylinders are accurately machined so as to provide the closest possible clearances.

While the invention can be used with both spark-ignition (petrol) and compression-ignition (diesel) engines, it is ideally suited to engines operating on gaseous fuels, such as natural gas or LPG. In this case, there is no liquid fuel to wash lubricant from the bores, hence minimal-lubricated supplemental mechanical seals can be used, if desired, for increased sealing efficiency.

Explanation of the Major Advantages of the Air-Sealing Technology:

Ultra-low-emissions:

- Hydrocarbons: Lean air:fuel ratio; stratified-charge; efficient after-burn
- Carbon Monoxide: Lean air:fuel ratio; stratified-charge; efficient after-burn
- Oxides of Nitrogen: Stratified-charge – the air:fuel mixture around the spark-plugs is rich (so that there is no excess air to form NO<sub>x</sub>) and the air:fuel mixture around the periphery of the combustion chamber is lean (so that the peak combustion temperatures are low... which prevents NO<sub>x</sub> from forming);
- Particulates: No oil to burn and form carbon deposits; continual supply of compressed air constantly cleans and cools all mating surfaces, and the fuel injectors and spark-plugs;

Higher Efficiencies:

- Mechanical: Significantly lower friction... no piston / cylinder-bore metal-to-metal contact
- Volumetric: Lower pumping losses; the compressed air used for sealing provides a super-charging effect (the degree of which can be varied as desired);
- Thermal: No fuel trapped and unburnt; lower heat losses;

Higher Fuel Economy: Higher efficiencies; lower friction; more efficient combustion; regenerative energy-saving; fuel shut-off during decelerations; engine stops (and automatically restarts) when the vehicle is stopped.

Engine Advantages – Compared to Conventional Engines of Comparable Power

Anticipated % Improvement

Ultra-low-emissions 10

Lighter & more compact      5  
Higher performance    5  
Smoother running    5  
Ultra-long-life    20  
Lower friction    5  
Higher mechanical efficiency   10  
Higher volumetric efficiency   10  
Higher thermal efficiency    5  
Better fuel economy    5  
Smaller starter motor    5

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