

New Air Hybrid Engine and Variable Valve Technology

Background

Hybrid electric vehicles are regarded as one of the most effective and feasible solutions to the global environmental concerns currently being faced by the auto sector. However, their manufacturing costs, complexity, and battery life remain significant barriers to their widespread adoption.

The University of Waterloo is actively seeking automotive suppliers and manufacturers interested in commercializing a new air hybrid engine technology and variable valve system.

Description of the invention

The new technology developed by University of Waterloo researchers provides for a new air hybrid engine technology capable of capturing vehicle kinetic energy in the form of high-pressure compressed air during regenerative braking. Through a novel compression process, the pressure levels achieved are much higher than existing air hybrid engines. In addition, utilization of a new electro hydraulic valve system provides optimal energy capture and seamless switching between different modes of air hybrid engine operation. This new variable valve system is fail-safe and can be used both in air hybrid engines and conventional internal combustion engines to improve efficiency and reduce emissions.

Advantages

High efficiency air compression / energy capture system allowing for:

- higher in tank storage pressure.
- increased fuel efficiency.
- simplified design:
 - minimal component weight/design envelope.
 - low maintenance.

Potential applications

- Vehicles:
 - improve overall efficiency and reduce emissions.
 - acceleration from full stop.
 - idle stop power supply (accessory drives including fan, a/c, alternator).
 - supercharge applications.
 - turbo boost from idle (zero lag).
- Gas compression for storage (Air, LP, NG, Hydrogen).

Reference

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