JAM, LTD

Company Background

JAM Consulting LLC (dba JAM, Ltd.) was formed in 1996 to continue development, patent and commercialize its internal combustion engine technology.

JAM Consulting LLC was initially developed for V-Twin motorcycle engines to solve poor fuel efficiency and low power problems. The success of the implemented technology in the V-Twin gasoline engines gave the company impetus to continue development and implement the same technology for diesel and gaseous fueled internal combustion engines.

To continue development of JAM, Ltd, a dynamometer/emissions test cell was set up in Reno, Nevada giving Speed of Air the ability to validate and develop the technology in a controlled environment.

The first JAM, Ltd. engine test utilized a Cummins B Series 5.9 12 valve diesel engine. This engine was selected due to results from early testing on farm equipment utilizing this engine and also because of the 5.9 engine's multiple stationary, off-road and on-road uses. During the development and testing of the Cummins 5.9 engine a considerable reduction of emissions were realized (significantly the reduction of NOx simultaneously with reductions in other criteria emissions) in conjunction with increased power and lower fuel consumption.

The data from the diesel engine, both internal and independently verified by a EPA/CARB certified lab, was presented to companies within the oil & gas industry using natural gas fueled engines for pipeline gas compression. Based on this test data, JAM, Ltd. was given an opportunity to test and validate our technology in a CAT G3516 TALE engine. This engine incorporated JAM, Ltd. and was independently tested on site resulting in lower emissions than the lowest emission CAT G3516 ULB (Ultra Lean Burn) engine. This engine has continued to run at this site with consistent results for approximately 35,000 plus hours.

Current development projects in process include:

- High altitude/low emission transit bus applications for diesel and natural gas engines (25,580 hours of run time).
- Landfill methane gas fueled low emission/reduced maintenance electric generation engines (12 ,500 hours of operation.)
- Mining haul truck high efficiency/low emission engines (17,570 hours of run time)

Owner:

Joe Malfa – Owner / Inventor – 40 years in the automotive industry. Inventor and innovator on development of intellectual property related to internal combustion engines. Experience includes technical training development and customer relations for Porsche Cars North America and director of corporate programs for development of business and technical programs for college curriculum. Expertise in internal Combustion engines, engine flow dynamics, automotive suspension, electrical systems, and vehicle emission testing.

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JAM, Ltd.

JAM, Ltd. Claim

Our patented, specially modified pistons and heads enabled a Cat G3516 TALE 2.0 NOx gr/BHP-hr lean burn engine to run in a stable manner at 81% lower NOx, long after the unmodified engine would have formed combustion deposits and started to knock, all while reducing other emissions and without worsening fuel economy.

Introduction to the Technology

The internal combustion engine technology developed by JAM, Ltd. focuses on optimization of efficiency within the combustion chamber by promoting better fuel mixing. The goal is to produce the lowest possible emissions and also low fuel consumption while maintaining or increasing power. JAM, Ltd. unconventional approach to this optimization has resulted in a dramatic improvement in spark-ignition (SI) performance as demonstrated in controlled tests.

To maximize the energy produced in spark-ignition (SI) engines requires combustion of an optimally mixed air/fuel charge with a uniform and complete flame front. To maximize thermal efficiency, the combustion process must be completed in a short time. In SI engines a properly timed and complete uniform combustion process can raise engine efficiency by extending the range of stable engine operation, allowing very dilute air/fuel mixtures to be used. Also, faster burning permits use of higher compression ratios without knock, again leading to an increase in efficiency[1].

The introduction of different mechanisms to control the turbulent air/fuel mixture flows, such as swirl, longer stroke/bore ratios and higher squish have had a large effect on the performance of state-of-the-art engines. One way to improve micro-turbulence that has not been researched a great deal is to “tune” the fluid boundary layer between the combustion flame front and the cooled metal that encloses the combustion chamber. This is an extremely important region of the combustion chamber as it influences the degree to which the flame front can approach the cooled metal surface before being extinguished or slowed excessively by that cooler surface.

The solution JAM, Ltd. developed influence the thermos-physical boundary layers within the combustion chamber of the engine to optimize the flame front and combustion efficiency. JAM, Ltd. use of a dimpling process (similar to a golf ball), directional grooves and thermal coatings is designed to achieve a micro turbulence creating a thermo physical boundary layer across the combustion surfaces (piston, cylinder head, cylinder liner and valves). The micro turbulent boundary layer created by this process has more drag initially but also has better adhesion to combustion wall surfaces and is less prone to separation. This micro turbulent boundary layer within the combustion chamber creates a stirring action at the surface which postpones detonation due to hot spots. It also scrubs carbon deposits off the surface which are one cause of hot spots.

The characteristic of the combustion with this technology is a uniform and complete flame front, releasing the heat faster and more completely, creating greater useful force on the piston top. This complete early burn of the air/fuel reduces emissions of Total Hydrocarbons (THC), Carbon Monoxide (CO), VOC (Volatile Organic Compounds), Formaldehyde (HCHO), and Nitrogen Oxides (NOx). NOx typically increases with lower THC and CO, but is decreased with SOA's technology owing to optimized air/fuel mixing and a faster combustion process[2] .

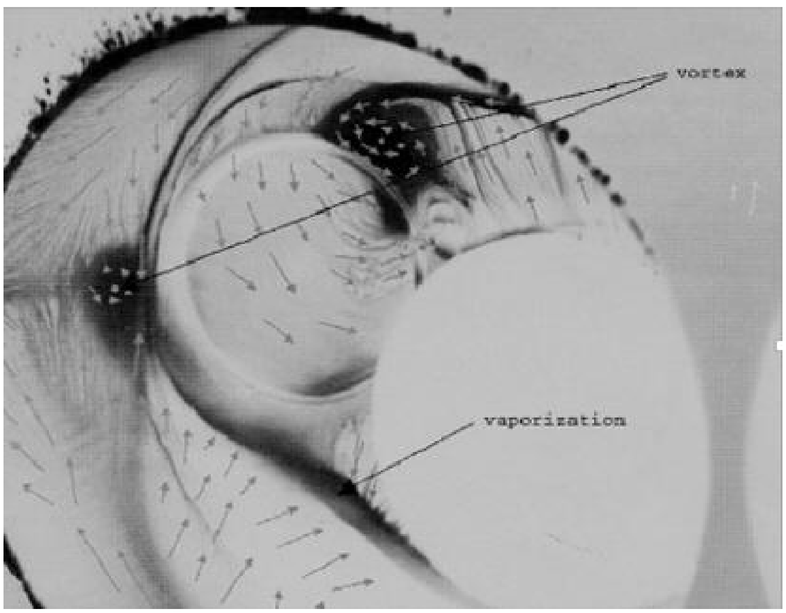

Image of vortices within a combustion chamber