

Split-cycle revolution

SCUDERI IS SET TO REVEAL RESULTS THAT PROVE ITS NEW ENGINE IS EVEN MORE EFFICIENT THAN FIRST EXPECTED

► With so much progress already made, Scuderi needs no introduction. The Massachusetts-based company has a very visible presence in engine technology, having first caught the industry's attention with the claim that it had solved the issues associated with split-cycle thermodynamics.

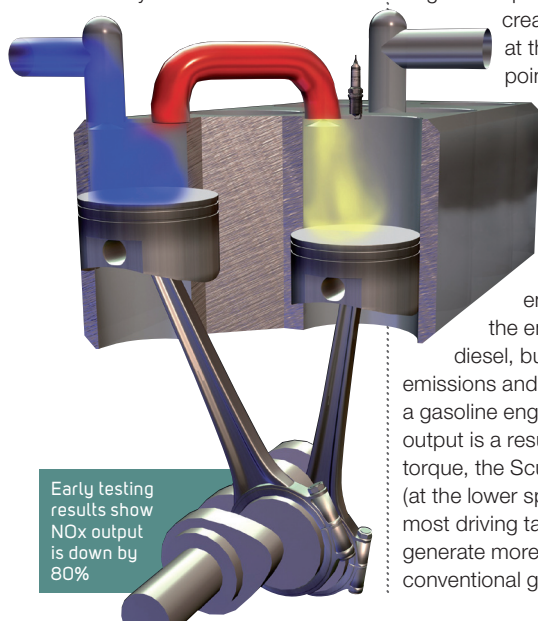
Called the Scuderi Cycle, the company's solution sounded too good to be true. But it was true – lower emissions, more efficient combustion, and a diesel-like torque curve were all modeled in computer simulations based on a new, split-cycle design that separated the four strokes of a conventional engine over two paired cylinders: one for intake/compression and the other for power/exhaust.

So good were the performance predictions that some hailed the breakthrough as the most notable advancement in IC engines since the Otto Cycle.

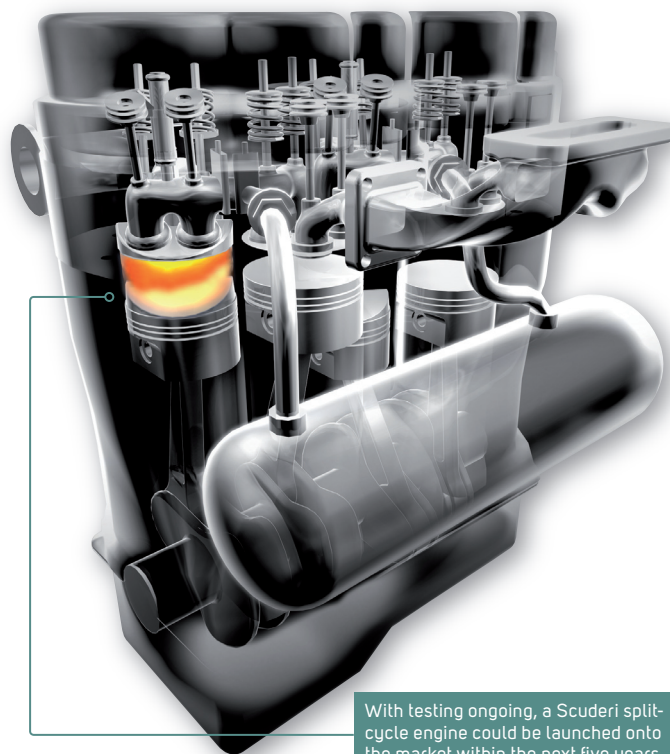
The next hurdle was to prove these theoretical results in prototype form, which is where Scuderi is today – hard at work with an independent test team at Southwest Research Institute in San Antonio, Texas.

Stephen Scuderi, VP and patent attorney for the Scuderi Group, is following progress closely and is in confident mood. "Last year we unveiled our prototype, with a firm belief it would prove our simulations; now that the engine is up and running, we can say for sure it does," he says. "Through engine speeds in the range of 1,000 to 3,250rpm, we continue to see successful and consistent combustion, with the diesel-like torque curve that was predicted."

The most surprising characteristic of the new engine design is its torque curve. Because of its unique combustion process of 'firing after top dead center', the Scuderi engine can put the peak pressures created by combustion at the peak torque points on the crankshaft. As a result, maximum torque can be reached at speeds below 1,000rpm and maintained throughout the entire speed range of the engine – similar to a diesel, but at the weight, cost, emissions and internal pressures of a gasoline engine. Because power output is a result of speed and torque, the Scuderi gasoline engine (at the lower speed ranges where most driving takes place) will generate more power than a conventional gasoline engine.



Early testing results show NOx output is down by 80%



With testing ongoing, a Scuderi split-cycle engine could be launched onto the market within the next five years

Right through its preliminary testing, the Scuderi engine has shown more power, higher efficiency, and lower emissions than a conventional gasoline engine. "Overall we have found efficiency improves between 10-20%, depending on the level of turbocharging. The Scuderi Cycle allows lower peak temperatures and preliminary results show NOx emissions reduced by up to 80%," notes Scuderi.

With this knowledge, some may have been tempted to move earlier in pronouncing that the future had arrived, but the world has come to Scuderi. At a time when the pressure is on all OEMs and engine builders to act quickly in reducing emissions and fuel consumption, all solutions are being considered. And none are better than those that require minimal re-design and development, something which the

Scuderi Cycle – which requires no new components or technology over a regular, four-stroke Otto Cycle engine – offers.

Now, the industry is waking up to the potential this engine design could deliver – smaller, more efficient, leaner and greener engines, with benefits for both diesel and gasoline powertrains. With 14 of the world's top 20 manufacturers now in advanced discussions with the group, it's possible a Scuderi split-cycle engine could be on the road within three to five years. ●

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