

## Homogenous charge compression ignition (HCCI) technique: a review for application in two-stroke gasoline engines

### Abstract

Since Homogeneous Charge Compression Ignition (HCCI) has significantly low temperature combustion, NO<sub>x</sub> will be dramatically reduced while the mixture will be largely homogenous, thus soot formation will naturally be reduced too. The system can be operated under an ultra lean fuel condition thus able to achieve high efficiency and low emission. In addition to, two-stroke engine's advantages i.e. light, simple construction, less components and cheap to manufacture, two-stroke engines have the potential to pack almost twice the power density than that of four-stroke engine with similar capacity. The problem of poor combustion efficiency and high white smoke emission, which is caused by burnt engine oil, can be addressed by the incorporation some features that will ultimately convert a typical two-stroke engine into an efficient HCCI engine demonstrating bulk combustion. This paper briefly described an attempt to modify two-stroke engine design to prove the claim. Such an engine with its conversion will be suitable for use as a prime mover for series Hybrid Electrical Vehicle (HEV) giving high power-to-weight ratio and improved efficiency of the overall vehicle powertrain system.