Dissimilar Cam Profile (DCP) For Airflow Improvement In A CNG FUELED Engine

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PRODUCT BACKGROUND

- Swirl increases turbulence in engine operation, as such a camshaft modification was found to enhance the airflow turbulence through Dissimilar Cam Profile (DCP). The profile can be used by car manufacturers to make advanced camshafts for improving engine operations.
- 3D modeling (CFD) of DCP was done to analyze in-cylinder combustion and flame speed propagation. The engine model is the K3-VE a widely used engine.
- Combustion analysis of engine pressure data, mass burn rate and flame speed was used to determine overall enhancement of engine operating with CNG fuel on DCP. Not many available research has done this comparison to date.

PRODUCT CAPABILITIES

1. Improve flow characteristics using dissimilar cam profile
2. Increment in engine performance and efficiency due to DCP

BENEFITS

1. The engine efficiency improved by 5.7% and BSFC reduced by 5.4%, respectively with 1 mm DCP at 4000 rpm.
2. Emissions of HC reduced by 41% while CO increased slightly by 0.17%. NOx decreases by 56% from baseline CNG.
3. Significant improvement on performance is seen for Coefficient of Variation (COV)impe at 4000 rpm from 11.8% (unstable combustion) to 8.7% (stable combustion) on the 1 mm DCP

PUBLICATIONS


NOVELTY

“Improved Swirl Turbulence and Combustion Through DCP Modification”

- Increases fuel heat release earlier and thus pressure per cycle is increased nearing to gasoline levels

MARKETABILITY

- Collaboration with Focus Applied Technologies, USA.
- matSpeedcams Enterprise
- Perodua (M) PVT LTD
- Diاملر (M) PVT LTD
- Target Market in NGV using countries

ACHIEVEMENTS

- Gold – Dissimilar Cam Profile for Airflow Improvement in a CNG Engine (CTREX 2016), Leader, 7~8 March 2016, UMP.
- Special Award from Automotive Excellence Center, AEC, PKM, UMP.
- Gold – Dissimilar Cam Profile for Airflow Improvement in a CNG Engine, 12~14 May 2016, Kuala Lumpur Convention Centre, Malaysia, ITEx