

High Thermal Efficiency and Low Emissions with Supercritical Gasoline Injection-Ignition in a Light Duty Engine

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Poster Location: P-16

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BENEFITS OF TSCi™

- Indicated thermal efficiency > 45%
- Low NOx and smoke emissions
- Control of Ignition delay using fuel temp
- Fuel pressure: <300bar
- Compatible with current technologies:
 - VGT turbocharger
 - EGR cooler and valve
 - VVT: variable valve timing
 - Non-SCR aftertreatment

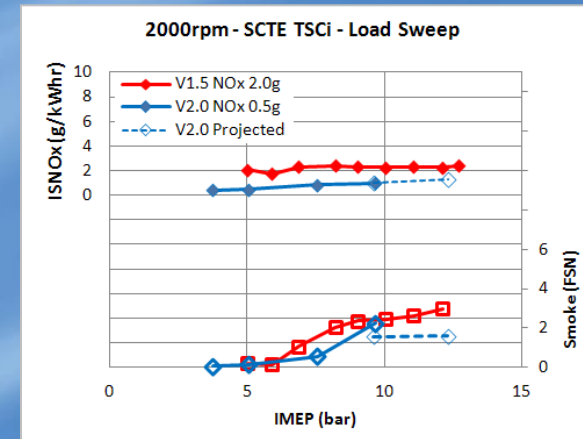
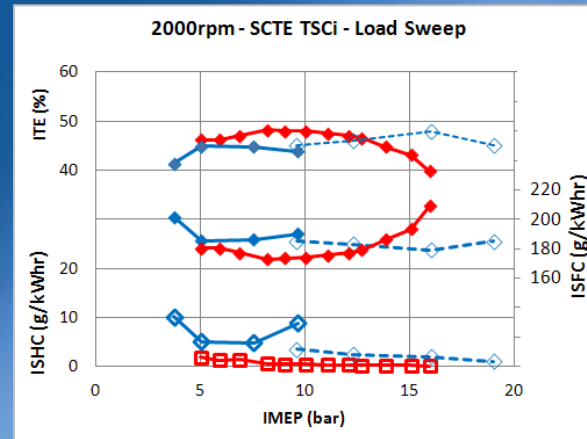
COMBUSTION CONTROL

- Combustion is controlled directly with start of injection timing and is robust over wide range
- Supercritical state enables enhanced premixing
- Fuel temperature can be used to control level of fuel premix
- Able to control ignition delay and combustion duration using fuel temperature and pressure

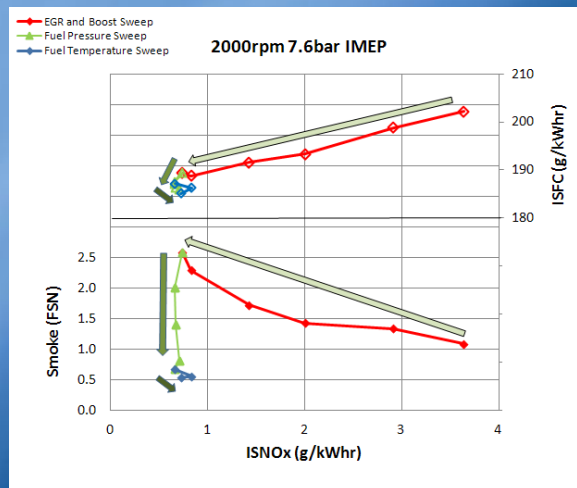
LOAD RANGE

- Stable idle performance at 750rpm
- Maximum load capability greater than 16bar IMEP

ENGINE TEST DATA : Bore X Stroke = 75 X 88.3mm CR17.5:1



NOX AND SMOKE EMISSIONS



EMISSION CONTROL

➔ EGR and Boost applied for NOx reduction and fuel consumption reduction

➔ Fuel pressure optimized for low smoke

➔ Fuel temperature optimized for further improvement in ISFC and smoke

- Premix optimized for ISFC and emissions