MAHLE Powertrain
Jet Ignition® (MJI) - Active

Achievements:

• Fast, stable combustion enabling extension of the stable lean limit of the engine (\(\lambda > 2\) for gasoline, natural gas; \(\lambda > 3\) for H)
• Knock mitigation due to rapid combustion & lean limit extension, enabling high compression ratio
• Whole map operation without the requirement for a 2nd ignition system in the main chamber
• Compatible with PFI or DI fueling
• MJI-enabled dilute combustion produces significant efficiency / fuel consumption benefit - translates across wide range of base engine technology levels
MAHLE Powertrain
Jet Ignition® (MJI) - Passive

Drive Systems

• >42.5% BTE / < 200 g/kWh BSFC from a 1.5L 3-cylinder engine
• MFE provides 4 key functions simultaneously:
  › CR > 14:1
  › Engine-out NOx < 100ppm
  › Production boost system
• 20% increase in peak BTE over baseline
• Idle and catalyst heating capability & feed gas emissions equal to conventional central spark plug

Applications

• Robustness demonstrated across multiple engine applications: passenger car, HD on-road & off-road, race-winning motorsport, small engine, CHP, alt fuel
• Enabling technology for safe, stable large-bore H2 combustion
• Numerous multi-cylinder engine demonstrators produced for commercial partners & internal research
• Flexible operating strategies: fully dilute map, “dual-mode” lean + stoich, combustion mode-switching

Advantages

• Maximising Active MJI benefits requires both pre-chamber & combustion system optimisation
• Full range of inter-related engineering services to develop solutions:
  › Design
  › Combustion, performance & structural analysis
  › Engine development & testing
  › Transient and cold emission capabilities
  › Calibration & controls

MAHLE Powertrain Ltd
13.210-877
Jundiaí / São Paulo
Brazil
Tel. +55 11 4589-0400

MAHLE Automotive Technologies
No. 1299 Huan Cheng Bei Road, Fengpu Industrial Park 201
401 Shanghai, Fengxian District
China
Tel. +86 21 5136-0595

www.mahle-powertrain.com