THE LINEAR ENGINE PATHWAY OF TRANSFORMATION

Nigel Clark, Parviz Famouri, April Covington, Matthew Robinson
Center for Alternative Fuels, Engines and Emissions
West Virginia University
March 22, 2012
Overview

Concept:
Internal combustion engine where power is translated in a linear fashion as opposed to traditional rotational translation

Linear Engine Advantages:
- Minimal moving parts
  - Reduced maintenance
  - Simplified lubrication
- Higher power density
  - No flywheel, crankshaft, camshaft(s)
- Increased efficiency
  - Low piston skirt / friction forces
- Adjustable compression ratio
  - Multi-fuel operation
  - Employment of new combustion regimes

WVU 3rd Gen Linear Engine:
- Compression ignition
- Two opposed pistons on a common linking shaft
- Permanent magnet linear alternator
- 250 Watt charging system
- Independent cooling (air-cooled)
- Low temperature combustion
- Direct in-cylinder injection (piezoelectric injectors) or homogenous charge port injection
- Spring-assist (operating frequency control)