

COMBUSTION DIAGNOSTICS - HCCI ENGINE

Acentech



CONSULTING SERVICES

- Vibration signal processing

PROJECT DESCRIPTION

The appeal of the homogeneous charge compression ignition (HCCI) engine is its low potential for air pollution. This engine operates with no spark plug, and relies on a very lean and well mixed, or homogeneous, fuel/air mixture which is compressed until it auto-ignites. Since there is no spark plug, the combustion onset must be controlled by other means.

Acentech's RH Lyon Division developed and utilized vibration signal processing technology to determine the exact onset of combustion, which has special value for this type of engine since the information can be used to adjust the combustion timing. The vibrations that result from combustion are sensed on the exterior of the engine and are processed to produce a signature that determines the onset and strength of combustion, providing information that could otherwise only be obtained using expensive and fragile pressure sensors inside each engine cylinder. The methods we developed have been tested in the lab on prototype and simulated HCCI engines and shown to be effective.