

Internal Combustion Engines ... Tuning for Optimum Performance

The Problem

To create an in-cylinder pressure measurement and analysis system to optimize engine design and performance.

The Solution

By observing the measured in-cylinder pressure and the location of the peak pressure with respect to top-dead-center piston position (TDC), an engine operator can quickly tune the engine for optimum performance.

Creative Technical Solutions, Inc. has developed the OPTIMIZER, a flexible, low-cost PC-based in-cylinder pressure measurement and analysis system based on a DAQ board controlled by LabVIEW software. To find more information on this product, you can web search on "In-cylinder pressure with Labview" or go directly to the web address:

<http://sine.ni.com/csol/cds/item/vw/p/id/217/nid/124200>

Measuring Top-Dead-Center

CTS used Philtec's D model probes to accurately determine TDC during motoring tests. This technique eliminates the need to use indexed wheels and markers to estimate TDC.

Sensor Installations

Normal

Before the head is installed a fiberoptic sensor can be mounted perpendicular to the piston head. The engine would be driven by the starter or dyno during TDC determination.

Angled

Retro-reflective tape is attached to the piston head. A standard D model sensor is mounted in the spark plug hole. The sensor can register piston motion with as much as 45° inclination to the piston surface.

