

# Pre-Ignition Prevention Program Consortium

Southwest Research Institute® (SwRI®) announces the formation of the Pre-Ignition Prevention Program Consortium to begin in January 2011. The two-year consortium will focus on pre-competitive technology and will investigate the effects of lube composition, lube and fuel interaction, and engine hardware on low-speed pre-ignition.

## Background

Due to the rising price of oil and the growing concern over CO<sub>2</sub> emissions, fuel economy has become a more significant factor in the automobile industry than at any time in the past 10 years. In addition, in the U.S. market, the new Corporate Average Fuel Economy (CAFE) standards will increase the focus on improving fuel consumption in light-duty vehicles. OEMs and engine suppliers are taking steps to improve fuel consumption, primarily by downsizing and boosting, which consists of reducing engine displacement while increasing the specific power output by turbocharging to maintain the larger engine's torque and power output. Unfortunately, downsized and boosted engines exhibit destructive abnormal combustion mode called low-speed pre-ignition, or LSPI.

## Consortium Goals

The primary objective of the proposed consortium is to develop a fundamental understanding of the factors that lead to low-speed pre-ignition (LSPI) and design a solution to eliminate it.

Additional objectives are to:

- Understand the effect of the physical and chemical properties of lube oil and its interaction with fuel on LSPI
- Understand how hardware design can be used to mitigate the effects of lube oil on LSPI
- Develop a fuel and/or lube specification and test methodology that allows SwRI to identify fluids that improve LSPI performance

## Engines

The engines that will be used represent a cross-section of currently available and potential future engines. SwRI will use one small bore (1.6L to 2.0L L4) engine and one larger bore (3.5L V6) to ensure that the measurements and developed solutions are universal. Both engines will be fully instrumented using custom-designed data acquisition for measurement of LSPI.

## Participants

The Pre-Ignition Prevention Program Consortium is open to all interested industry clients.

## Deliverables

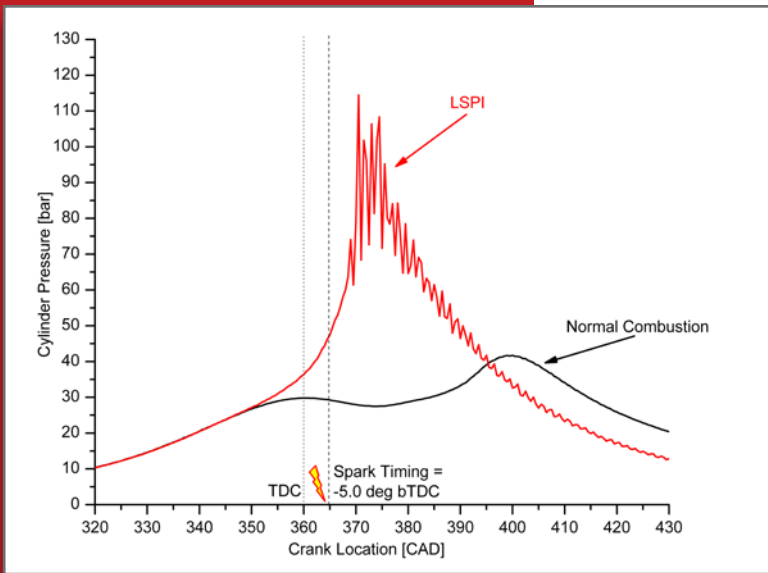
Consortium deliverables include:

- A royalty-free, non-transferable, non-exclusive license to all intellectual property (IP) generated on this program
- A royalty-free, non-transferable, non-exclusive license to the background IP already generated by SwRI
- Detailed technical information on all test procedures and methods
- All data generated by the consortium
- Monthly progress reports
- Monthly conference calls
- A comprehensive final report
- Program Advisory Committee (PAC) meetings to review project progress at four-month intervals

## Schedule

The program will begin January 1, 2011, and run through January 1, 2013. There will be a kickoff PAC meeting at SwRI in January 2011, followed by PAC meetings approximately every four months.





From SwRI Internal Research Project 03.R8049,  
 "Investigation of Low-speed Pre-ignition in Boosted  
 Spark-ignited Gasoline Engines"

## Price

The total price for participation in this two-year program is \$225,000 for automotive OEMs, lubricant suppliers, and additive suppliers, and \$175,000 for other interested parties (e.g., other automotive suppliers). The minimum aggregate amount required to begin work is \$1.35 million and funding of at least \$2.25 million is required to consider the program fully funded.



Southwest Research Institute is an independent, nonprofit, applied engineering and physical sciences research and development organization using multidisciplinary approaches to problem solving. The Institute occupies 1,200 acres in San Antonio, Texas, and provides more than 2 million square feet of laboratories, test facilities, workshops and offices for more than 3,200 employees who perform contract work for industry and government clients.

**We welcome your inquiries.  
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