



KNOCK OFF LOW-SPEED PRE-IGNITION

Protect GDI engines with the upgraded Shield® Motor Oil formulations for passenger vehicles.

KEEPING THE
WORLD
RUNNING
SMOOTHLY.



WHAT IS LSPI?

Low speed pre-ignition (LSPI) is a premature ignition of the air-fuel mixture in the combustion chamber. Other terms used for LSPI include “super knock,” “mega knock,” and stochastic pre-ignition.

The low speed in LSPI (which refers to the speed of the engine, not the speed of the vehicle) occurs in the 1200 to 2700 rpm range. This low speed pre-ignition is very violent and causes over pressurization of the combustion chamber that can lead to damage and failure of the piston, rings, valves, and other internal components.

Over 120 million turbocharged gasoline direct injection (GDI) vehicles have been produced since 2010 and are at risk for LSPI. And since GDI engines now make up over half of new car production, lubricant suppliers and consumers need to know that the oils they are getting at quick-lube shops or installing themselves will provide the necessary protection against LSPI.

WHAT CAUSES LSPI?

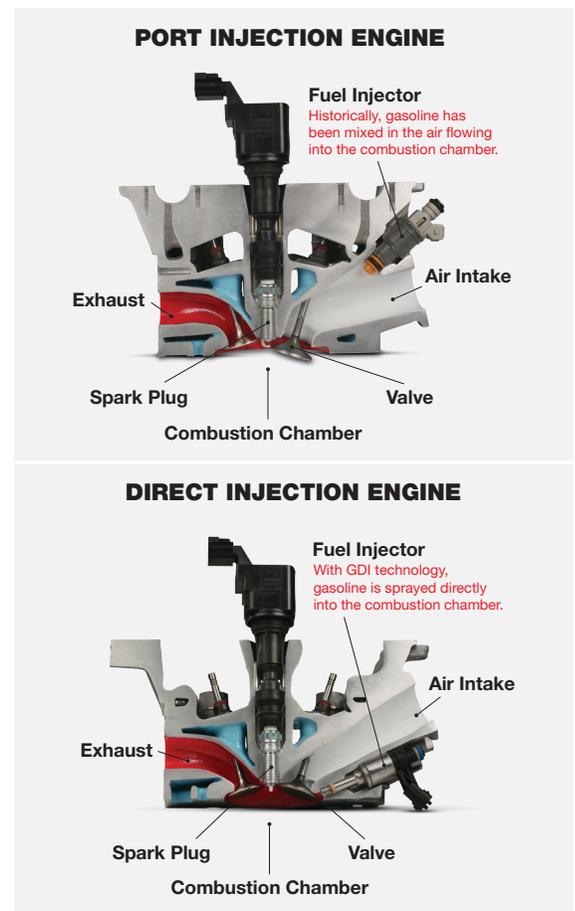
Historically, gasoline has been mixed or injected in the air flowing into the combustion chamber. While these methods have worked well over the past 100 years, it is not the most efficient means of fuel delivery.

With GDI technology, gasoline is sprayed directly into the combustion chamber under high pressure. This allows for improved mixing of fuel with the incoming charge of air. This improved mixing results in increased efficiency of the engine and decreases the total amount of fuel used in the combustion process. This translates to more power from a smaller-displacement engine and improved fuel economy for the vehicle.

HOW DO I PREVENT LSPI?

Phillips 66® Lubricants is upgrading its complete passenger car motor oil line to combat LSPI and meet the upcoming SN Plus specification. Contact a Phillips 66 sales representative to learn more about the upgraded Phillips 66 Shield® Motor Oil formulations.

Watch our LSPI videos: [YouTube.com/Phillips66Lubricants](https://www.youtube.com/Phillips66Lubricants)



UPGRADED PRODUCT FORMULATIONS TO ADDRESS LSPI



FULL SYNTHETIC

The highest levels of wear protection and overall performance for engines make this the ideal option for most vehicles.



SYNTHETIC BLEND

Designed to provide the added performance and wear protection of a synthetic oil for anyone not ready to make the jump to a full synthetic.

RE-REFINED

An environmentally responsible, part synthetic automotive engine oil designed to provide excellent engine protection.



LUBRICANTS