Top Tier Gasoline Recommendations for Gasoline Engines

The AERA Technical Committee offers the following information on recommended top tier gasoline fuel stations. This information is provided in hopes consumers will realize differences exist in gasoline fuel supply sources. Audi, BMW, GM, Honda Toyota and Volkswagen all approve of suppliers listed in this bulletin.

A class of fuel called TOP TIER detergent gasoline is appearing at retail stations of various fuel marketers in the United States, Canada and Puerto Rico. This gasoline meets the detergent standards developed by seven automotive companies. All vehicles will benefit from using TOP TIER Detergent Gasoline over gasoline containing the "Lowest Additive Concentration" (LAC). LAC is also known as the minimum detergent treat rate, recommended by the Environmental Protection Agency (EPA) in the United States and in Canada, the Canadian General Standards Board (CGSB). Those vehicles that have experienced engine deposit related concerns may especially benefit from using TOP TIER Detergent Gasoline.

GM strongly recommends the use of TOP TIER Detergent Gasoline. TOP TIER Detergent Gasoline is guaranteed not to contain harmful organometallic additives, which are sometimes used to raise a fuel's octane rating and could harm the vehicle's emission system.

The EPA and CGSB require only a minimum amount of detergent in gasoline. This minimum amount is not adequate to keep the engine running at optimal conditions for the life of the vehicle. TOP TIER Detergent gasoline contains 2-3 times more detergent than the EPA and CGSB minimum requirement, resulting in a lower amount of intake valve deposits (IVD).

These IVD's can negatively affect fuel economy, emissions, and performance. General Motors, BMW, Honda, Toyota, Volkswagen, Audi and Mercedes-Benz developed the TOP TIER Detergent Gasoline Standards and support the use of TOP TIER Detergent Gasoline by recommending it in their vehicle Owner Manuals. All seven corporations recognize the benefits to the vehicle, the environment, and the consumer. Additionally, the companies recognize that by joining
together they can better address the industry concern with low fuel detergency levels and the intentional addition of metallic additives.

This is a voluntary program for fuel marketers and not all fuel marketers will offer TOP TIER Detergent gasoline. When fuel marketers make public announcements regarding that their gasolines have met the TOP TIER Detergent Standards, they will appear on the list of brands under the Retailers tab at the Home website of www.toptiergas.com

A Cleaner Engine Has Environmental and Vehicle Performance Advantages
The following engine intake valve graphics show the difference between an engine that did not use TOP TIER Detergent gasoline and an engine that did at 10,000mi (16,093 km).

![Engine intake valve using Non-TOP TIER Detergent gasoline having the minimum detergent treat rate with more than 1,000mg of deposits.](image)

Deposits (1) on the intake valve reduce fuel economy by creating a porous surface that collects wet fuel, thereby affecting the air to fuel mixture in the cylinder and releases fuel late in the combustion cycle leading to increased unburnt hydrocarbon (HC) and carbon monoxide (CO) emissions (2). Likewise fuel injectors may become restricted with carbon deposits over time resulting in an incorrect injector spray pattern and similarly increasing HC and CO emissions.
Engine intake valve using TOP TIER Detergent gasoline having a high detergent treat rate with less than 50mg deposits.

As can be seen, this intake valve is significantly cleaner resulting in optimal fuel economy and drivability performance as well as reduced emissions.
TOP TIER Gasoline Retailers - United States, Canada and Puerto Rico

Additional gasoline retailers are added to the TOP TIER list when their gasolines meet the TOP TIER Detergent Gasoline Standards. For the most up to date list of fuel marketers that offer TOP TIER Detergent Gasoline, refer to this website: www.toptiergas.com

TOP TIER GASOLINE RETAILERS:

USA

- 76 Stations
- Aloha Petroleum
- ARCO
- Beacon
- BP
- Chevron
- Conoco
- Costco Wholesale
- Country Mark
- Diamond Shamrock
- Entec Stations
- Express Convenience Centers
- Exxon
- Hawaii Fueling Network (HFN)
- Holiday Station stores
- Kwik Trip / Kwik Star
- MFA Oil Co.
- Mobil
- Ohana Fuels
- Phillips 66
- QuikTrip
- Road Ranger
- Shamrock
- Shell
- Sinclair
- Suncor Energy Inc
- Super America
- Texaco
- Tri-Par Oil Co.
- Valero

CANADA

- Chevron Canada
- CO-OP
- Costco Wholesale
- Esso
- Petro-Canada
- Shell Canada
- Tempo

PUERTO RICO

- Puma Energy Caribe, LLC
- Shell