PETRONAS SYNTIUM

PETRONAS

Understanding PETRONAS Syntium

What Is A Petrol Engine?

A petrol car typically uses a spark-ignited internal combustion engine, rather than the compression-ignited systems used in diesel vehicles. In a spark-ignited system, the fuel is injected into the combustion chamber and combined with air. The air and fuel mixture is ignited by a spark from the spark plug inside the engine.

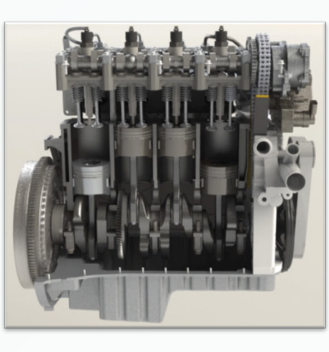

Image from a petrol engine

(Source : https://online.lubrizol.com/relperftool/hd.html)

The Difference Between Petrol And Diesel Engine

Petrol engines and diesel engines are quite similar. They are both internal combustion engines designed to convert the chemical energy available in fuel into mechanical energy. This mechanical energy moves pistons up and down inside cylinders. The pistons connected to a crankshaft, and the up-and-down motion of the pistons, known as linear motion, creates the rotary motion needed to turn the wheels of a car forward.

Both petrol engines and diesel engines are responsible for converting fuel into energy through a series of small explosions or combustions.

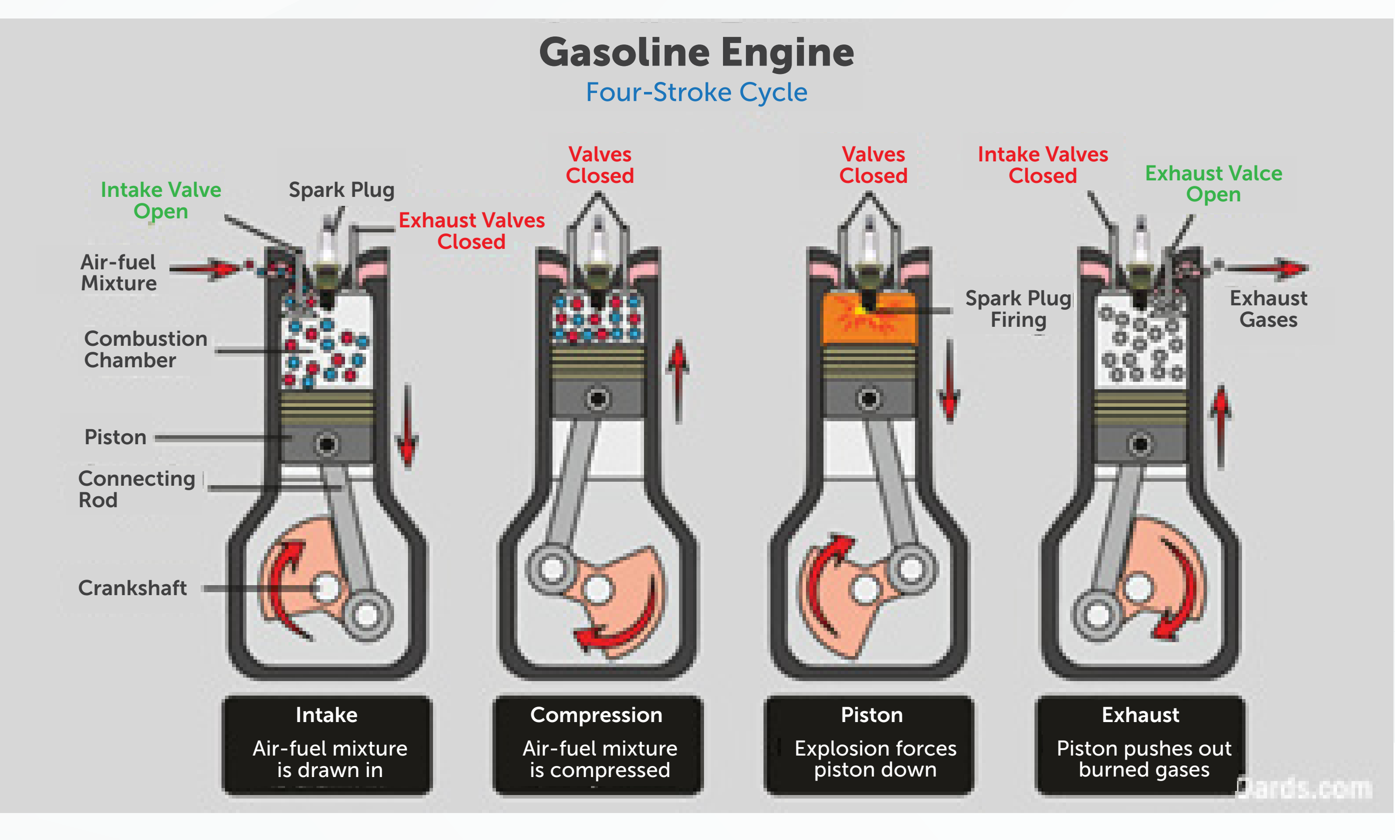

Image of a petrol engine operated

(Source: https://teresasgarage.com/automotive-411/automobile-history/engine-fundamentals-101)

Petrol — Main Comparison — Diesel

Petrol	Diesel
In a petrol engine, air mixes with the fuel, which is then compressed by pistons and ignited by the sparks from spark plugs. In a diesel engine, the air is compressed first, and then the fuel is injected	Diesel engine has no spark plug, that intakes air and compresses it, and that it then injects the fuel directly into the combustion chamber (direct injection). It is the heat of the compressed air that lights the fuel in a diesel engine.

Petrol Engine Revolution

Over the last 15 years, modern automobile petrol engines have been getting more and more efficient to meet the demands of government regulations for increased fuel economy. By having said that, the use of lower viscosity oils can help to support inefficiency and improve fuel economy by decreasing engine friction.

Therefore, switching from a higher viscosity oil to a recommended lower viscosity can help decrease engine friction, which can help improve fuel economy.

Petrol Engine Oil Technology

An engine is a harsh environment for a lubricant engine oil must be formulated to cope with many different challenges which can affect engine operation.

Some factors are driving change in current engine oil requirements and development.:

- Emissions regulations created to reduce emissions and higher cost of fuel results in consumers' demand improved fuel economy initiates significant engine and equipment design changes.
- These design changes lead to a demand for durability under severe operating conditions, extended warranties, and increased engine performance
- Providing maximum efficiency, reducing emissions, and increasing durability and engine protection is vital. The technology evolution is challenging as the engines and their components become more sophisticated over time.

Difference Between Synthetic, Semi-Synthetic and Mineral

Synthetic Oil

Synthetic oils undergo extensive treatment in the lab to make them significantly superior to their mineral counterparts. As a part of the process, the mineral oil is broken down into its most basic molecules, which helps remove any undesired substances and impurities. The molecules of synthetic oil are also very consistent in their size and shape, offering superior lubrication protection. The broken-down molecules of synthetic oil also lend themselves well to being tailored to specific requirements like performance in low or high temperatures, or under extraordinary stress.

Apart from performing exceptionally well in extreme cold and hot conditions, these engine oils have other superior properties too. These include lesser evaporation, low sludge formation and better detergent properties.

Semi-Synthetic Oil

Semi-synthetic oil, also known as synthetic blend oil has a small amount of synthetic engine oil blended in with mineral oil to boost its properties without escalating the cost by much. The addition of synthetic oil enhances its viscosity and wear resistance at higher temperatures and stress. Synthetic-blend engine oils can also offer better performance at lower temperatures, based on the requirements.

Mineral Oil

A most basic variety of engine oils and is most commonly used for a large majority of everyday vehicles. Mineral oils are refined petroleum oils which undergo treatment to perform across a broad temperature range protection and comply with specific requirements of automotive manufacturers. There is a wide range of quality available within mineral oils too, though their price is generally lower than the other two varieties of oils. These engine oils work well for every day in conditions which are not too extreme

Each oil on the market today contains a carefully balanced formulation of base stocks and advanced additives explicitly selected to meet engine and emission system requirements. Extensively R&D and lubricant testing enable PETRONAS Lubricants to develop high performing engine oils needed for the increasingly severe environments in the engine compartment.

Specifications

API Rating

The American Petroleum Institute (API) is the organization that provides the standard specification for the automobile engine oil based on two categories, that is petrol and diesel.

Engine Oil Licensing and Certification System provide a simple designation of letters and numbers that allows engine manufacturers and oil marketers to give the users the information they need to ensure that the proper oil selected for an engine. Each letter/number designation identifies a service category (e.g., SN), which linked to a series of tests that the oil must pass before it can carry that designation. The API "S" series describes oil standards primarily for petrol engines while the API "C" series describes oil standards for diesel engine service.

API SN is the latest specification and most advanced technology surpassing API SM, SL, SJ, SH, and others.

Advantage of the API SN Plus

API SN PLUS is a new motor oil specification developed for turbocharged engines that are being developed in response to automakers request for motor oils that protect against Low-Speed Pre-Ignition (LSPI). LSPI is an engine condition known to occur in Turbocharged Gasoline Direct Injection (TGDI) engines. In other words, Low-Speed Pre-Ignition (LSPI) is an abnormal combustion phenomenon observed at low engine speeds in which the fuel or air mixture in the combustion chambers ignites before spark timing. This Low-Speed Pre-Ignition (LSPI) can be mitigated by changing the engine oil formulation.

The objective of API SN PLUS, motor oil specification, is also intended to complement API SN and ILSAC GF-5 and aimed at addressing the increasing impact of Low-Speed Pre-Ignition in Turbocharged Gasoline Direct Injection (TGDI) engines.

Acea Oil Sequences Rating

The ACEA European Oil Sequences is defined as European Automobile Manufacturers Association represents a group of Europe-based car, van, truck and bus makers.

The ACEA 2016 European Oil Sequences for Service-fill Oils comprises of 3 sets (classes) Sequences.

Vehicle type	Specification	Performance tested
Gasoline and Light Duty Diesel Engines	A3/B3	Direct injection engines
	A3/B4	Direct injection engines
	A5/B5	Fuel economy & performance
Engines with After Treatment Devices	C1	Low SAPS & fuel economy
	C2	Mid SAPS & fuel economy
	C3	Mid SAPS
	C4	Low SAPS
	C5	Fuel economy
Heavy Duty Diesel engines	E4	(Semi)Synthetic
	E6	(Semi)Synthetic, Low SAPS
	E7	Mineral
	E9	Mineral, Low SAPS

ILSAC Rating

The International Lubricants Standardization and Approval Committee (ILSAC), is formed in 1992 by AAMA (American Automobile Manufacturers Association.

The representatives consist of OEM players like DaimlerChrysler Corporation, Ford Motor Company and General Motors Corporation) and JAMA (Japan Automobile Manufacturers Association) to define the need, parameters, licensing and administration of lubricant specifications.

Where ACEA was set up to develop standards to help consumers, ILSAC was created to help car manufacturers. It is mediation between SAE and OEM itself and widely used and accepted in North America, Japan & some countries.

Classified PCMO oil according to its fuel economy requirements in addition to its corresponding API performance level

ILSAC GF-1 & 2	Obsolete
ILSAC GF-3	API SL + Fuel Economy
ILSAC GF-4	API SM + Fuel Economy
ILSAC GF-5	Latest

Latest ILSAC rating is GF-5 which Introduced in October 2010. Designed to improve fuel economies and maintain them over time and to ensure adequate protection of new engine technologies and to protect post-treatment systems

PETRONAS Syntium with Cooltech™ technology

1. It can withstand the excessive engine heat with strong oil chains
2. It can resist oil break down in high temperature and prevent oil thickening to ensure oil flows smoothly. As such, it can effectively absorb and transfer heat away

The PETRONAS Syntium portfolio covers 3 main product tiers: Prestige (Fully Synthetic), Premium (Semi Synthetic) & Standard (Premium Mineral).

PETRONAS Syntium Complete Range

Prestige		Premium	Standard
PETRONAS SYNTIUM 7000	PETRONAS SYNTIUM 3000	PETRONAS SYNTIUM 800	PETRONAS SYNTIUM 500

PETRONAS SYNTIUM 7000	PETRONAS SYNTIUM 3000	PETRONAS SYNTIUM 800	PETRONAS SYNTIUM 500
0W-16 API SN Plus *API SN PLUS* 0W-20 API SN Plus *ILSAC GF-5*	5W-30 API SN Plus *ILSAC GF-5, DEXOS 1 GEN 2* 5W-40 API SN/CF *ACEA A3/B4, MB-Approval 229.5, BMW Longlife 01, VW 502 00/ 505 00, Porsche A40, RN0700/ RN0710, GM-LL-B-025*	10W-40 API SN/CF *ACEA A3/B3, MB-Approval 229.1, VW 501 00/ 505 00* 5W-30 API SN Plus *ILSAC GF-5*	15W-40 API SN Plus 10W-30 API SN Plus *ILSAC GF-5*
THE ULTIMATE SERIES WITH BETTER ENGINE RESPONSIVENESS	**OPTIMUM PERFORMANCE** FOR IMPROVED DRIVABILITY	**ADVANCED PERFORMANCE** FOR MODERN DAY DRIVING	**SUPERIOR HEAT DEFENSE** FOR SMOOTHER DRIVE