

Octane rating

Measurement of a fuel's ability to withstand knocking. Petrol in New Zealand is **91, 96 or 98 octane**

Additives

Added to fuel to help in combustion and to help prevent corrosion, to give easy starting, to clean deposits from fuel injectors, to prevent vapour locks, and to be stable in storage

Fuel

Air-Fuel Ratios

The air fuel ratio is the ratio of air to petrol by weight
The ideal air fuel ratio is the **Stoichiometric ratio** which is 14:7:1
Rich mixtures have a lower air fuel ratio, lean mixtures a higher ratio

Abnormal Combustion

Takes place when the flame front does not spread evenly across the combustion chamber

Detonation- result of fuel burning violently after the start of combustion

Pre-ignition – caused by fuel mixture being ignited by overheated surfaces in the combustion chamber

Spark knock – when the spark plug fires too soon and causes maximum pressure on the piston before top dead centre instead of after.

Vehicle Emissions

Result of the burning process in an engine

Hydrocarbon emissions caused from the discharge of unburned fuel

Carbon monoxide emissions caused from incomplete combustion of the petrol

Oxides of nitrogen emissions caused from the high temperatures of combustion

Particles are solids that are discharged from the vehicle exhaust such as carbon, soot and some fuel additives