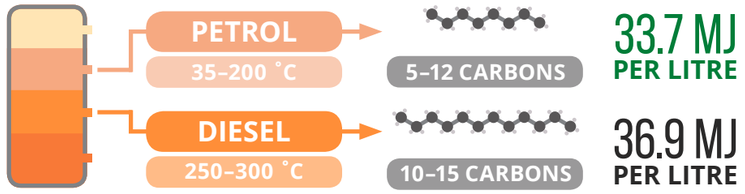
THE CHEMISTRY OF PETROL & DIESEL

There's a lot behind the fuel we put in our cars – in this graphic, we take a look at the differences between diesel, leaded petrol, and unleaded petrol.

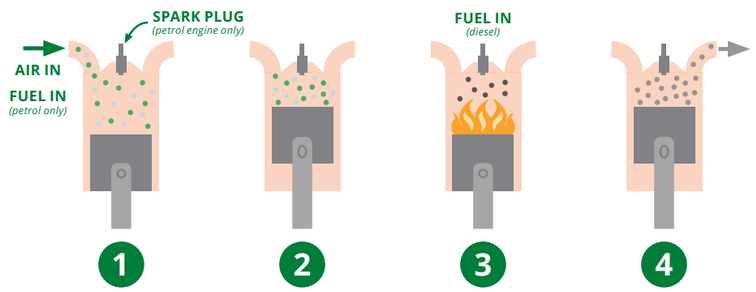
PETROL & DIESEL – THE DIFFERENCE

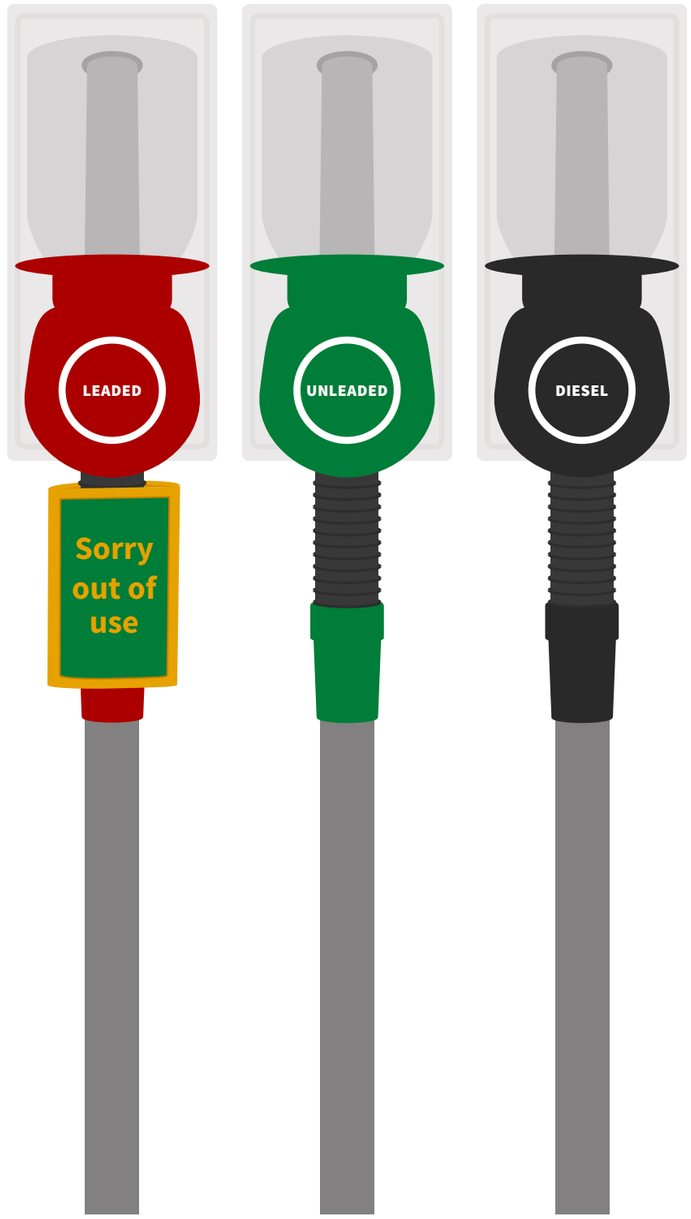


Petrol and diesel are both obtained by fractional distillation of crude oil. However, they differ in their composition. Diesel is a fraction of crude oil that is removed at a higher boiling point, and contains a larger amount of energy per litre, meaning more miles can be covered with the same volume of fuel.

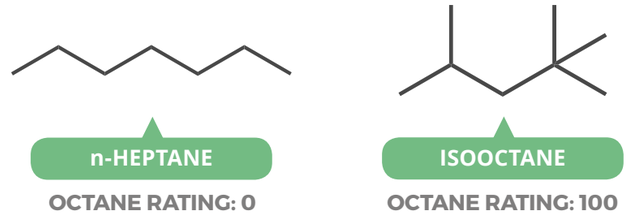
HOW ENGINES WORK

1. INTAKE ← AIR, FUEL INJECTED (PETROL ENGINES)
2. COMPRESSION ← HIGHER COMPRESSION WITH DIESEL
3. COMBUSTION ← FUEL INJECTED (DIESEL ENGINES)
4. EXHAUST ← WASTE GASES FROM COMBUSTION



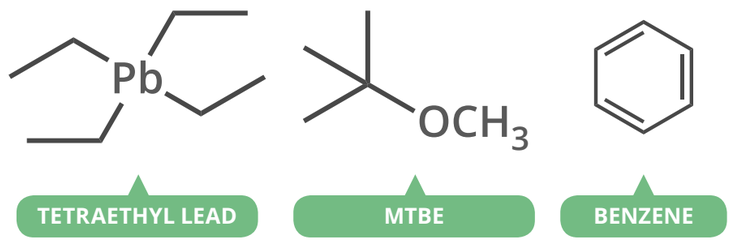


OCTANE RATINGS & KNOCKING



Knocking occurs when fuel's combustion doesn't occur in sync with the engine cycle. This causes lower engine efficiency and engine damage. Octane ratings gauge how well fuel avoids this problem, with higher values indicating less knocking. Isooctane (100) and n-heptane (0) are used as references.

LEADED & UNLEADED PETROL



Compounds can be added to petrol to boost its octane rating. Tetraethyl lead was one of these, but is now banned in most countries as it releases toxic lead fumes. Alternative anti-knocking agents used in unleaded petrol include methyl tertiary-butyl ether (MTBE), ethanol, benzene, and toluene.

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