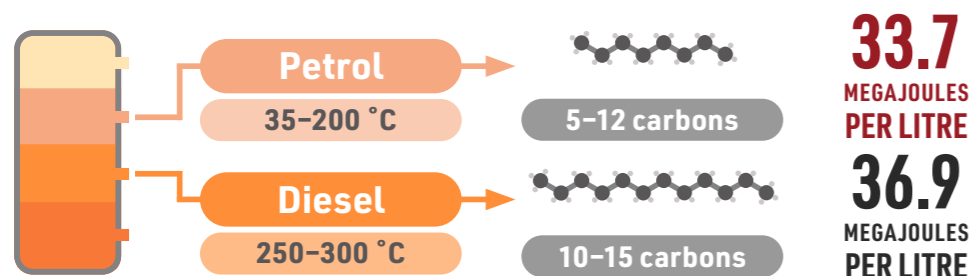


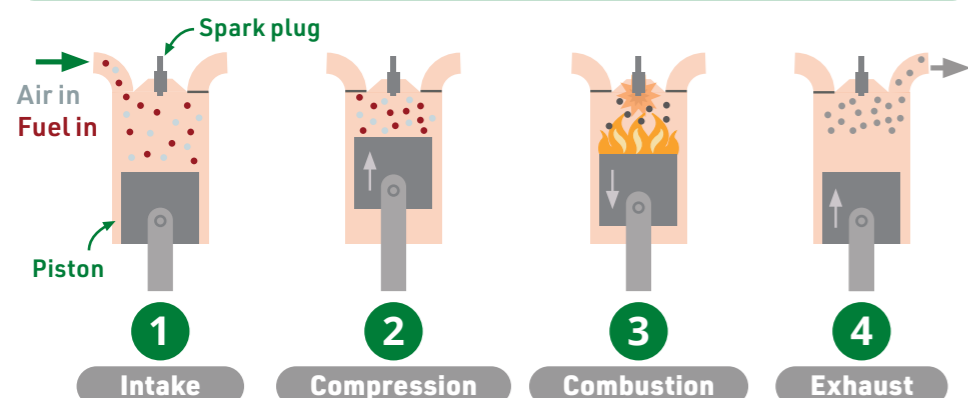
How do petrol and diesel fuel vehicles?

Petrol and diesel: What's the difference?



Petrol and diesel are obtained by fractional distillation of crude oil. Diesel is removed from crude oil 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 do engines work?



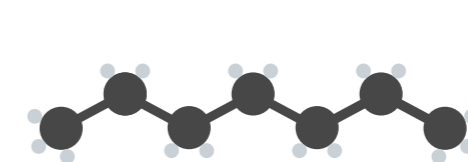
In the engine, a mixture of air and fuel is compressed and burned. Combustion forces the piston down, then the piston pushes back up to expel exhaust gases and the cycle begins again. In diesel engines, the fuel is injected after the air has been compressed, before combustion.



Engine knocking and unleaded petrol

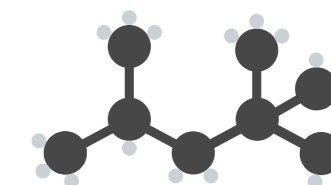
Engine knocking happens when the combustion of the fuel doesn't occur in sync with the engine cycle, causing lower engine efficiency and engine damage. Octane ratings measure how well fuel avoids this problem; higher values indicate less knocking. Isooctane and *n*-heptane are references.

KEY: ● Carbon ○ Oxygen ● Pb ● Hydrogen



n-heptane

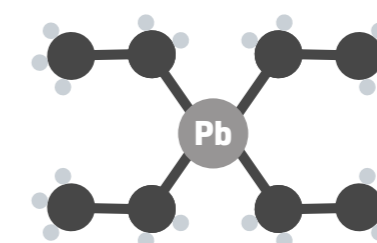
Octane rating: 0



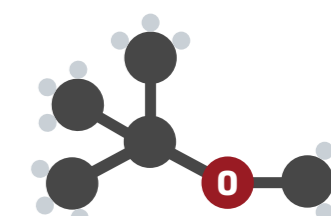
Isooctane

Octane rating: 100

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.



Tetraethyl lead



MTBE