

19MO611-AUTOTRONICS

UNIT 2-IGNITION FUNDAMENTALS



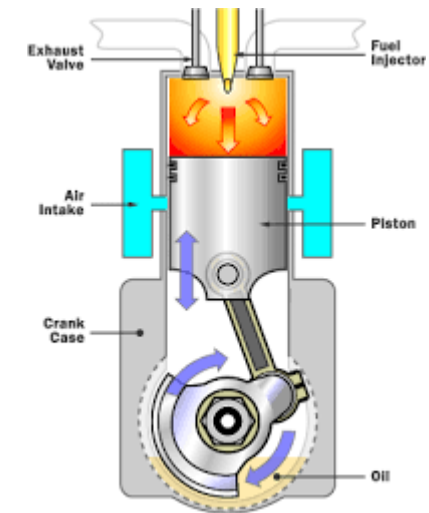
IGNITION FUNDAMENTALS

Ignition fundamentals refer to the basic principles and processes involved in initiating and sustaining combustion or ignition. Understanding these fundamentals is crucial in fields such as chemistry, physics, engineering, and fire safety. Here are some key concepts related to ignition fundamentals:

- Combustion
- Ignition Temperature
- Ignition Sources
- Fuel
- Oxidizer
- Flammability Limits
- Ignition Mechanisms

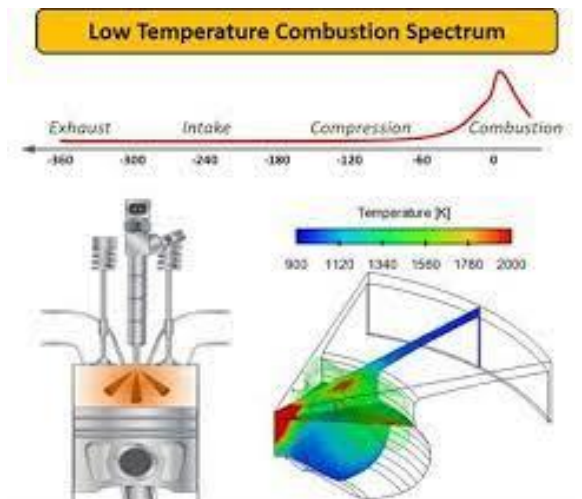
COMBUSTION:

- Combustion is a chemical reaction that occurs between a fuel and an oxidizer, typically oxygen, resulting in the release of heat, light, and various combustion byproducts.
- It is an exothermic reaction that produces flames and is essential for many energy conversion processes.



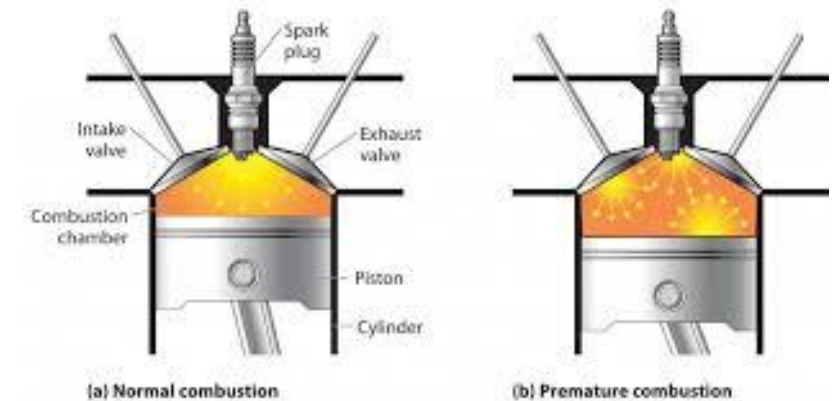
IGNITION TEMPERATURE:

- The ignition temperature (also known as the autoignition temperature) is the minimum temperature at which a substance can spontaneously ignite in the presence of an oxidizer, without an external ignition source such as a spark or flame.
- Different substances have different ignition temperatures, and it is an important parameter for assessing fire hazards.



IGNITION SOURCES:

- Ignition sources are external factors that provide the necessary energy to initiate combustion.
- Common ignition sources include open flames, sparks, electrical arcs, hot surfaces, chemical reactions, and radiant heat.
- Understanding potential ignition sources is crucial for fire prevention and safety.



FUEL:

- A fuel is any substance that can undergo combustion and provide energy.
- Fuels can be solid, liquid, or gaseous. Examples of common fuels include wood, gasoline, natural gas, coal, and hydrogen.
- The type and properties of the fuel influence its ignition characteristics.



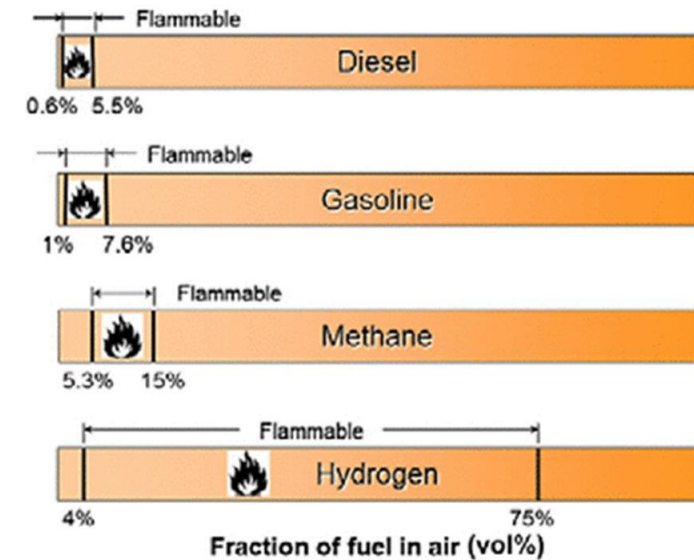
OXIDIZER:

- An oxidizer is a substance that facilitates the combustion process by providing oxygen or other oxidizing agents.
- In most cases, atmospheric oxygen acts as the primary oxidizer.
- However, some chemical reactions can occur in the absence of atmospheric oxygen using alternative oxidizers.



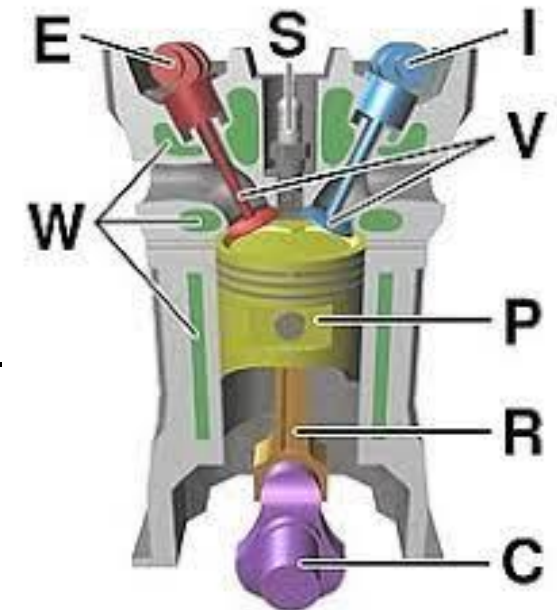
FLAMMABILITY LIMITS:

- Flammability limits, also known as explosive limits or flammable range, represent the concentration range of a fuel in a mixture with an oxidizer that can sustain combustion.
- Flammability limits define the lower explosive limit (LEL), below which the mixture is too lean to ignite, and the upper explosive limit (UEL), above which the mixture is too rich to ignite.



IGNITION MECHANISMS:

- Ignition can occur through various mechanisms, depending on the nature of the fuel, oxidizer, and ignition source.
- Some common ignition mechanisms include thermal ignition (heat-induced), electrical ignition (spark or arc), chemical ignition (reaction-induced), and impact ignition (mechanical impact or friction-induced).





THANK YOU