

Engines

Section no.3: cooling system

Section 3

The importance of cooling

Know the importance of a cooling system

01

Types of cooling system

Know the different types of a cooling system

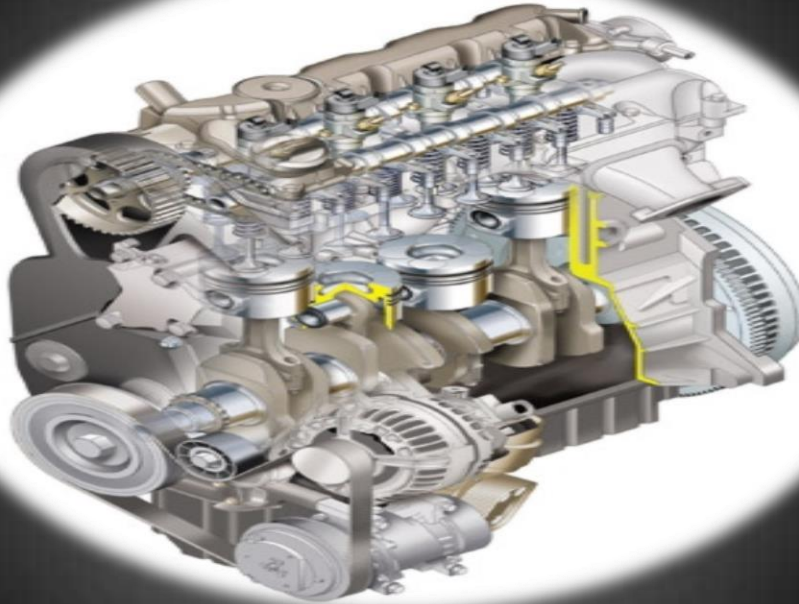
02

cooling system components

Know the components of a cooling system

03





The importance of cooling

Know the importance of a cooling system

The importance of cooling system



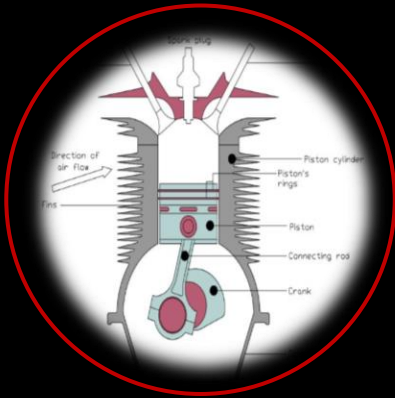
- it removes excess heat from the engine.
- it maintains the engine operating temperature during working.
- it brings the engine up to the right operating temperature as quickly as possible.



Types of cooling system

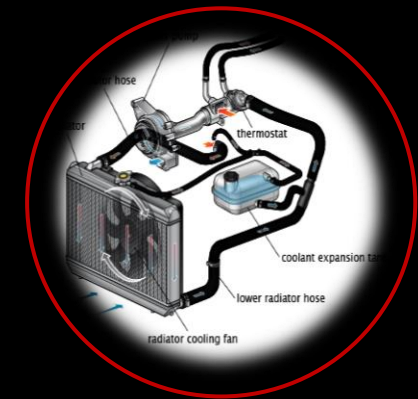
Know the different types of a cooling system

Types of cooling system



Air cooling system

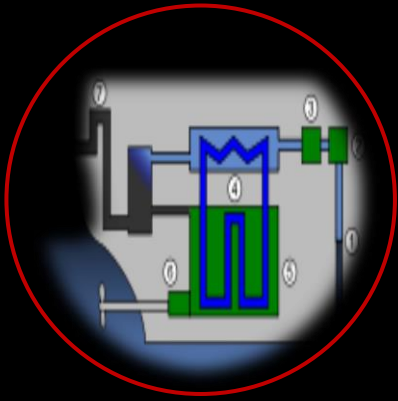
Is mostly tractors of less horsepower, motorcycles, scooters, small car engines.



Liquid cooling system

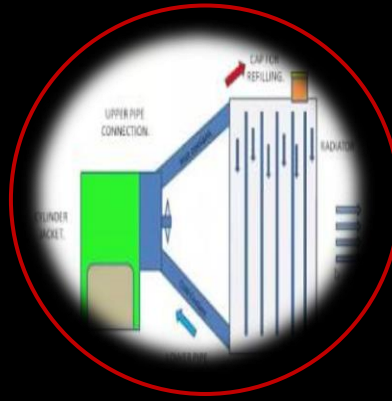
The most used today in automobiles.

Types of liquid cooling system



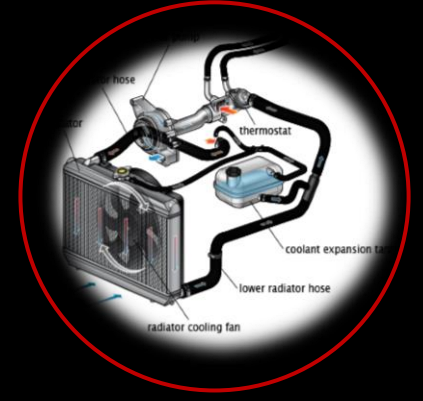
**Direct or non
return system**

Used in large engines



**Thermosiphon
system**

In this system the
circulation of water is
due to difference in
temperature



**Forced circulation
system**

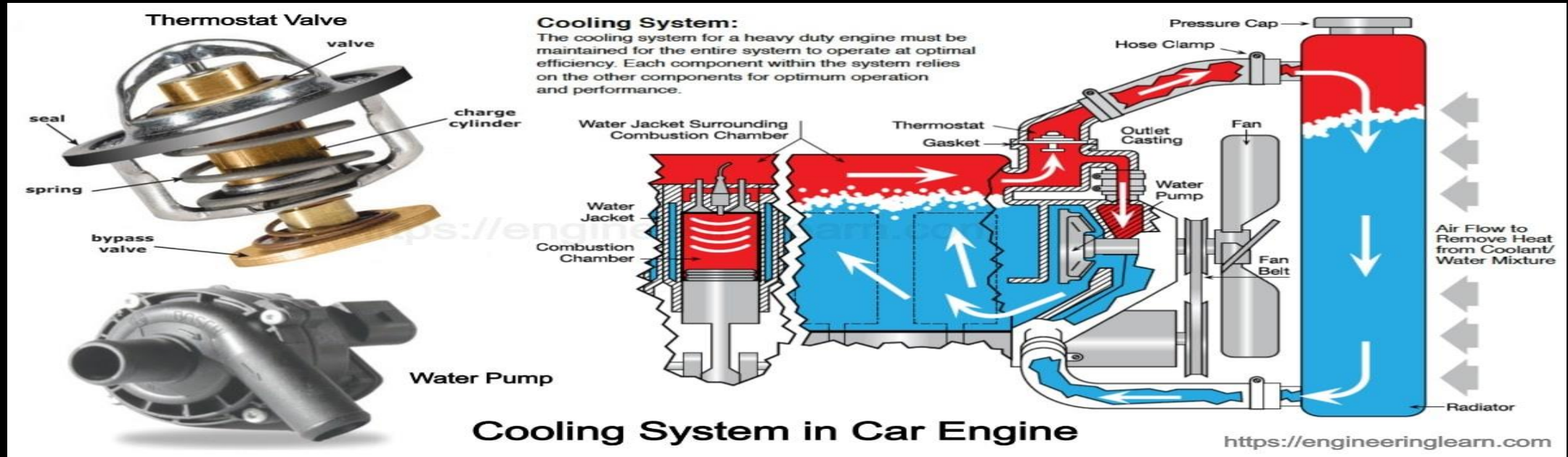
In this system the
circulation of water is
obtained by a pump



cooling system components

Know the different types of a cooling system

cooling system components



Radiator

Cooling fan

Water pump

Water jacket and
hoses

Thermostat and
cooling temperature
sensor

Radiator cap and
water expansion
tank

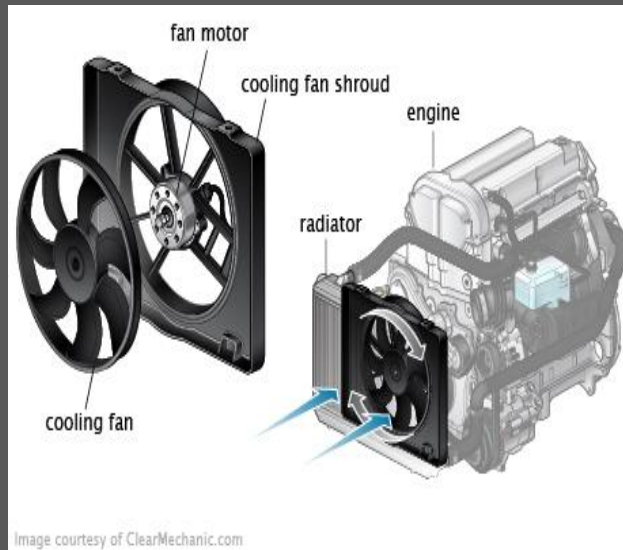
Radiator



- A radiator is the key component of the engine's cooling system. Its main role is to disperse a mix of antifreeze and water throughout its fins, which releases some of the engine's heat while taking in cool air before continuing to pass the rest of the engine

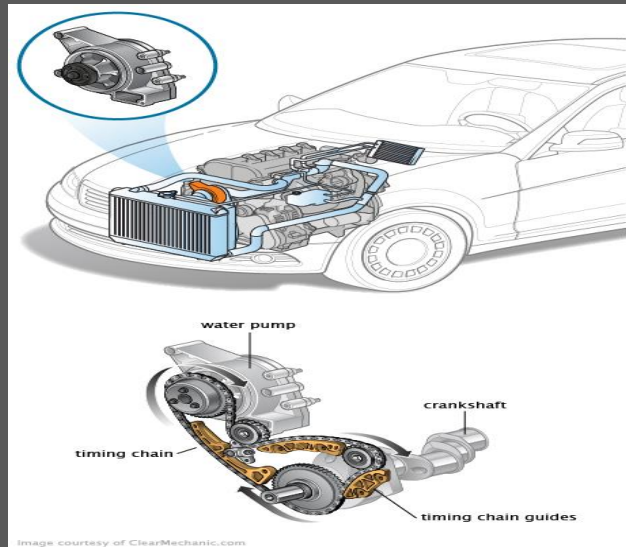
Cooling fan

- The fan system works by forcing air flow through the radiator. Its function is to facilitate and support the engine's temperature management

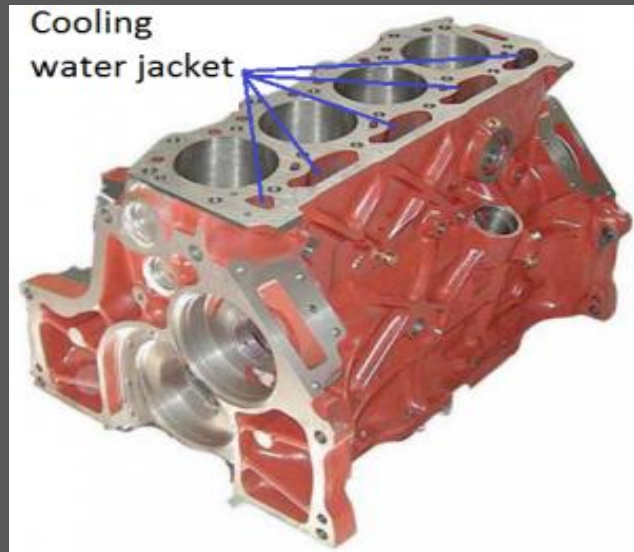


Water pump

- The water pump pushes coolant from the radiator through the coolant system, into the engine and back around to the radiator



Water jacket



- Water Jackets are water-filled casings that wrap around the engine.
- Inlet and outlet vents allow water to circulate.

Hoses

- The rubber hoses used to connect between the engine and the radiator.

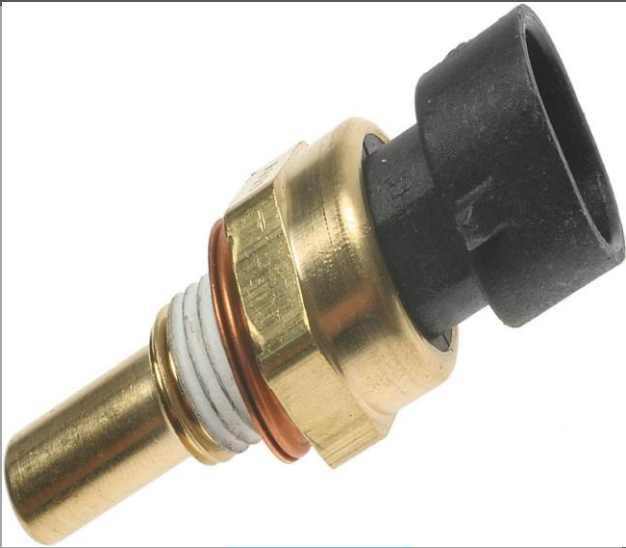


Thermostat



- To control the temperature of the coolant.
- To maintain a minimum operating temperature in the car's engine.

Cooling temperature sensor



- The coolant temperature sensor informs the engine control unit about the operating temperature of the engine,

Radiator cap

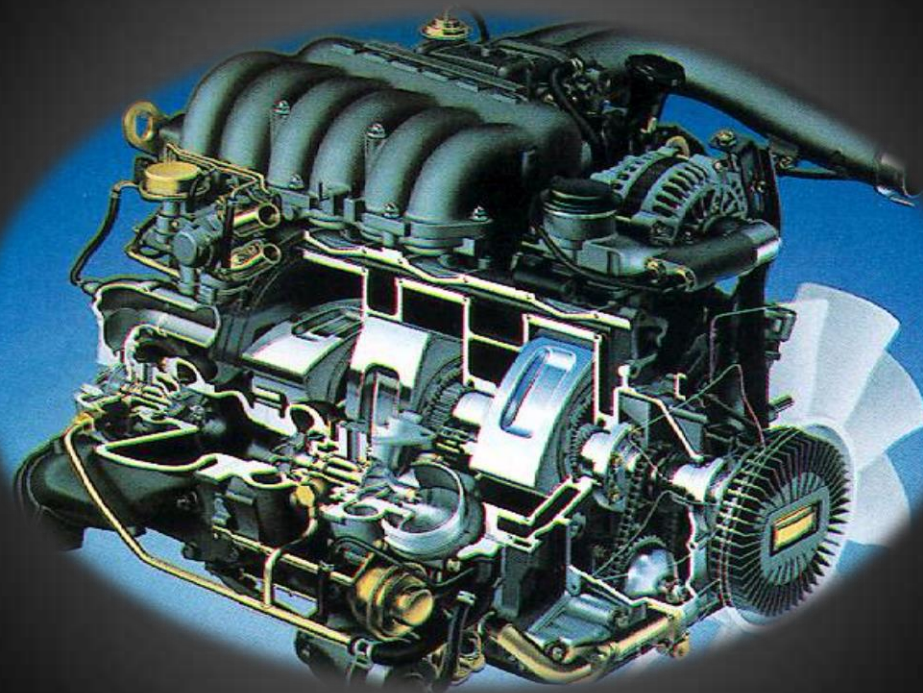


- Is a simple device that will maintain pressure in the cooling system up to a certain point.
- Regulates the maximum pressure, preventing damage to the hoses and radiator.

Water expansion tank



- The expansion tank absorbs excess coolant and minimizes excess pressure in the engine cooling system.



Summary

Summary

Section no.3

The importance of cooling

it removes excess heat from the engine.

maintains the engine operating temperature during working

prevents the engine from overheating and maintains its temperature at a safe level

Types of cooling system

Air cooling System

Liquid cooling system

Direct or non return system

Thermosiphon system

Forced circulation system

Cooling system components

Radiator

Cooling fan

Water pump

Water jacket and hoses

Thermostat and cooling temperature sensor

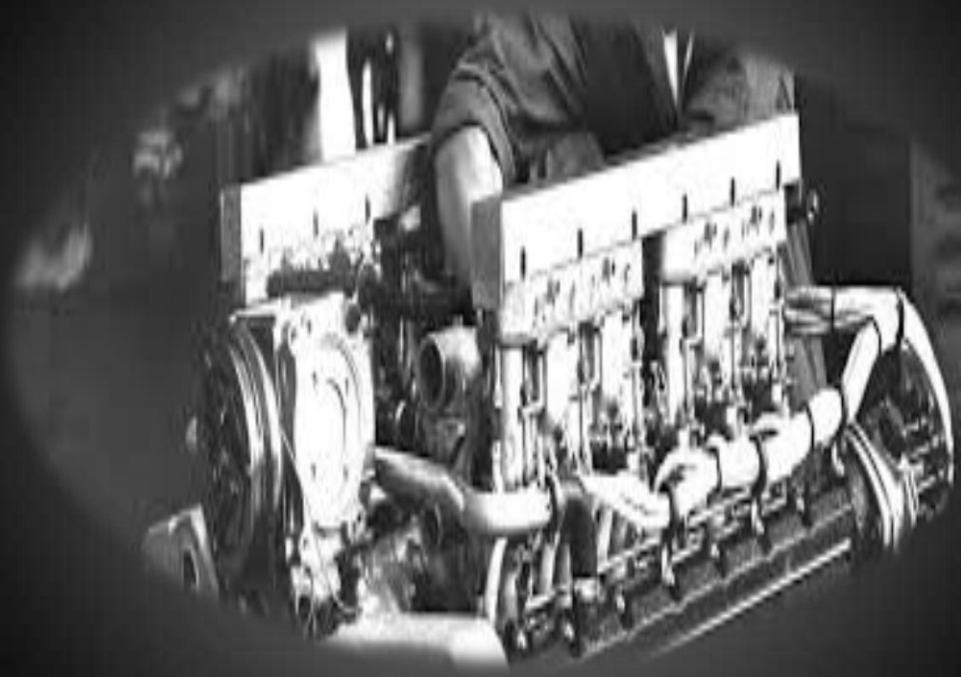
Radiator cap and water expansion tank



Videos

Videos to illustrate what has been explained

- How Engine cooling System Works (https://www.youtube.com/watch?v=y5p31F_dVJU).



Activity

Activity

- **Report about Different types of cooling systems (use – advantage – disadvantage).**

With my best wishes

Eng./ Gamal Ahmed Hendy