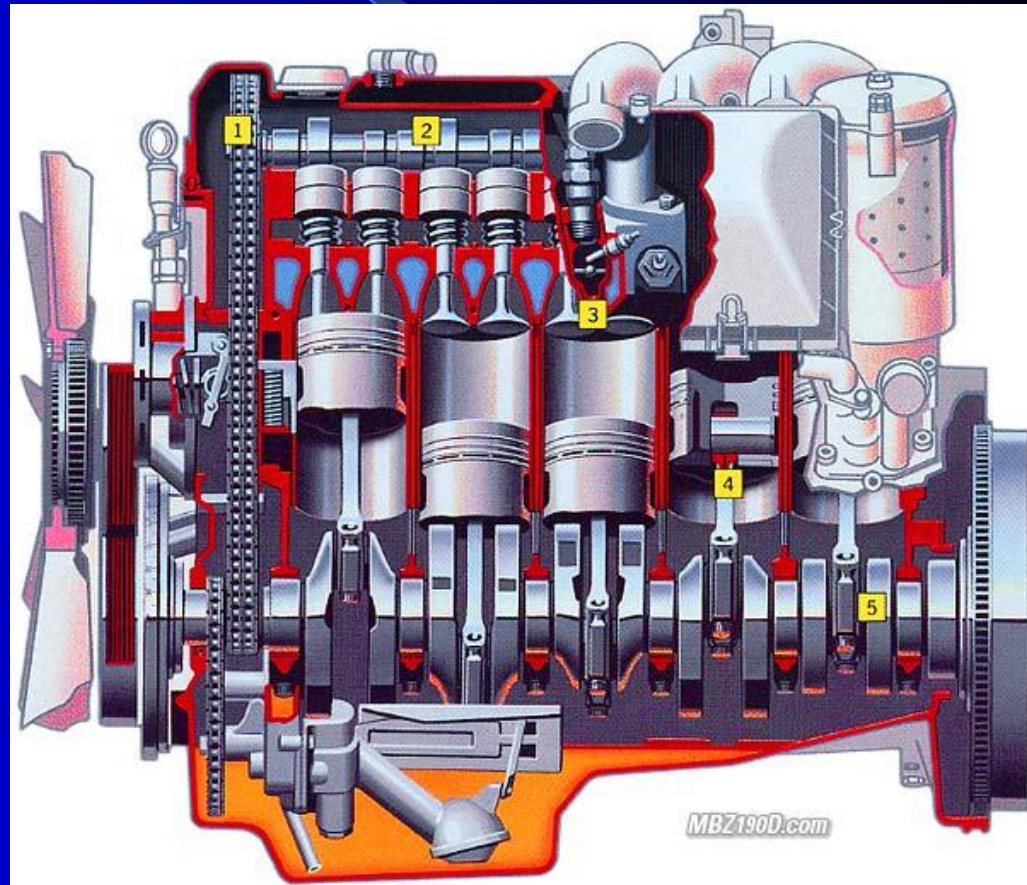


# Engines

Internal combustion engine needs fuel, ignition and compression in order to run.

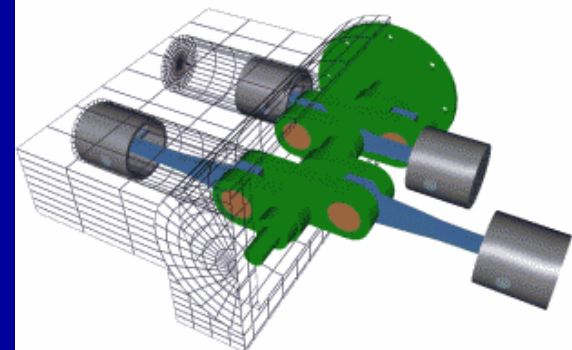
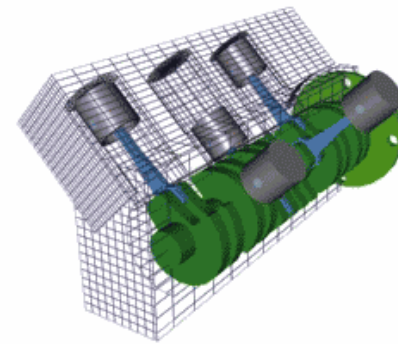
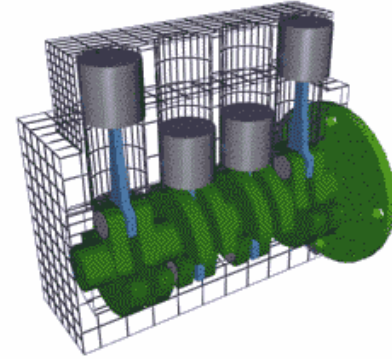
- Four-Stroke Gasoline Engine
- Two-Stroke Gasoline Engines
- Diesel Engine
- Rotary Engine
- Steam Engine



# Engines

## Configuration

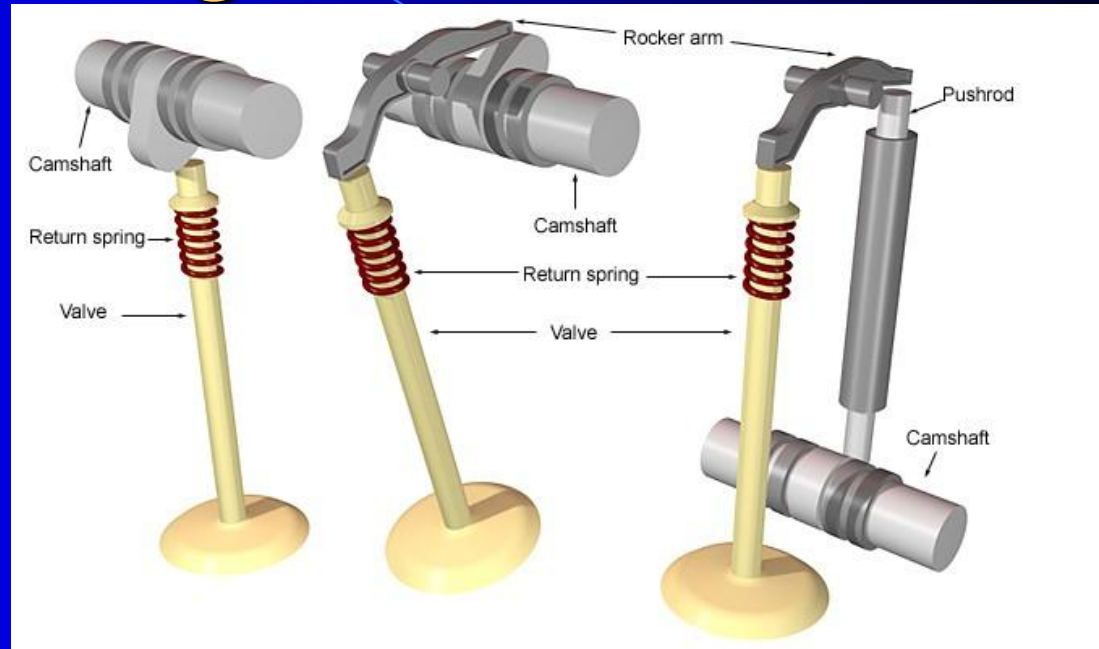
- Inline Engines: The cylinders are arranged in a line, in a single bank.
- V Engines: The cylinders are arranged in two banks, set at an angle to one another.
- Flat Engines: The cylinders are arranged in two banks on opposite sides of the engine



# Engines

## Parts

Valves: Minimum  
Two Valves pre Cylinder

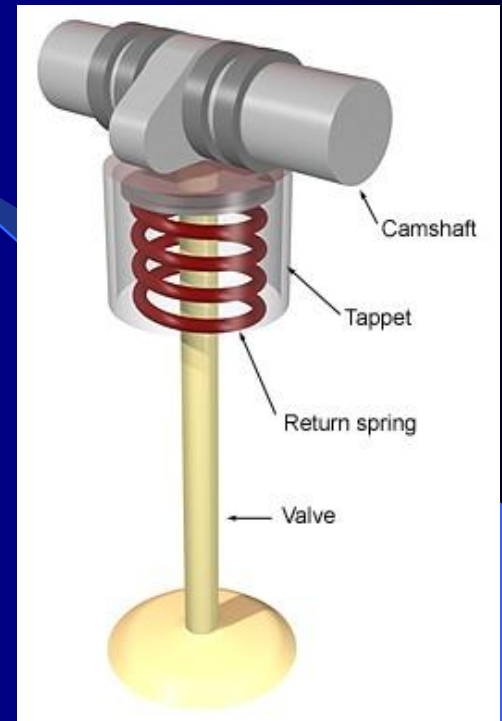


- Exhaust Valve lets the exhaust gases escape the combustion Chamber. (Diameter is smaller than Intake valve)
- Intake Valve lets the air or air fuel mixture to enter the combustion chamber. (Diameter is larger than the exhaust valve)

# Engines

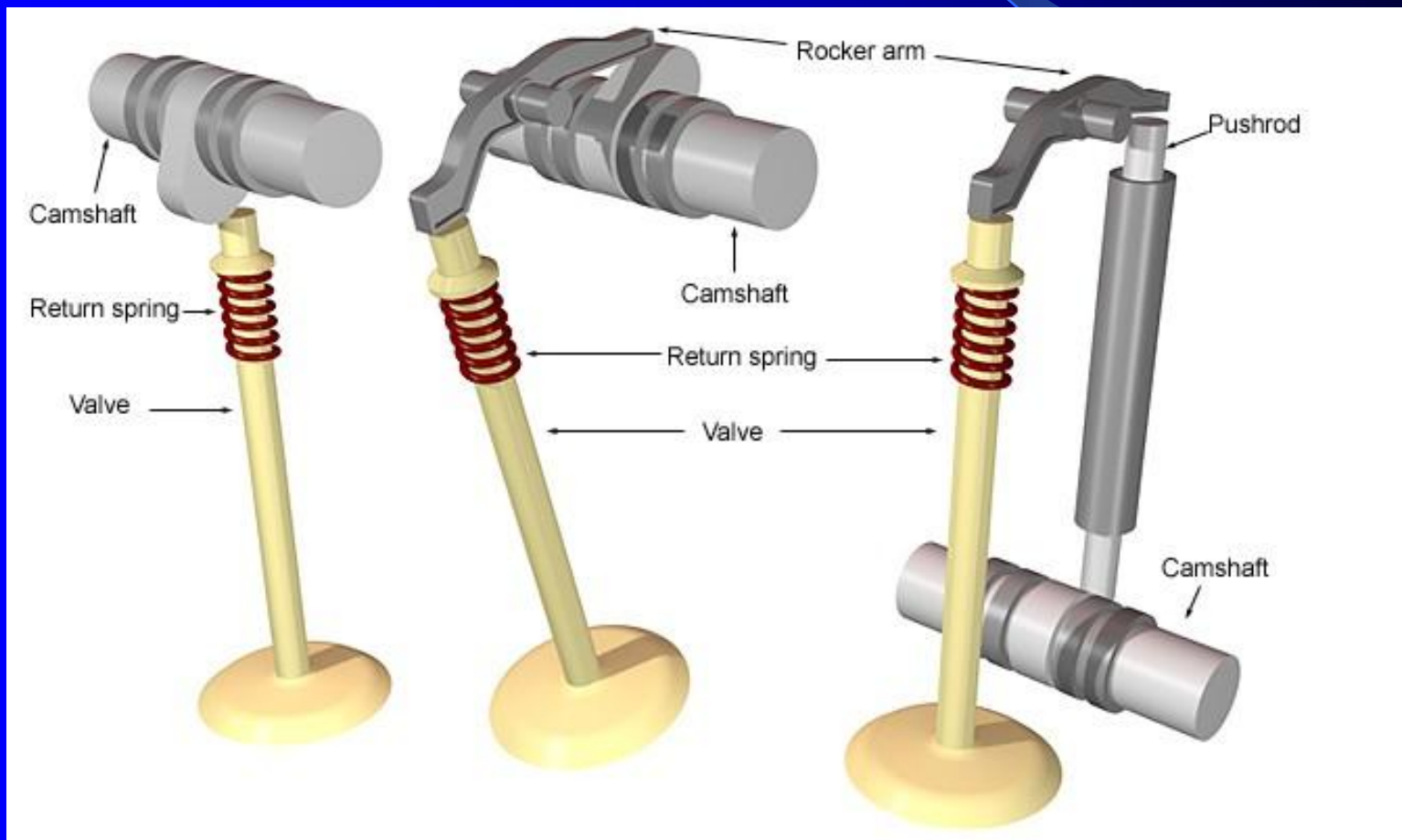
Valve Springs: Keeps the valves Closed.

Valve Lifters: Rides the cam lobe and helps in opening the valves.



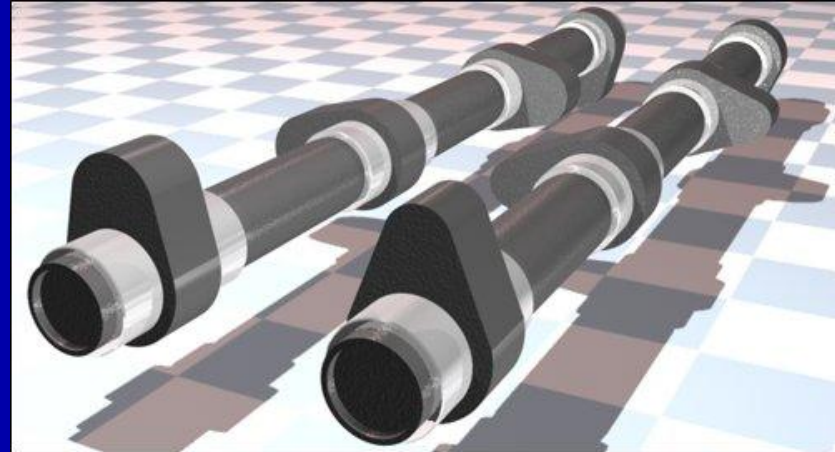
# Engines

Different arrangement of valve and camshaft.



# Engines

**Cam Shaft**: The shaft that has intake and Exhaust cams for operating the valves.



**Cam Lobe**: Changes rotary motion into reciprocating motion.



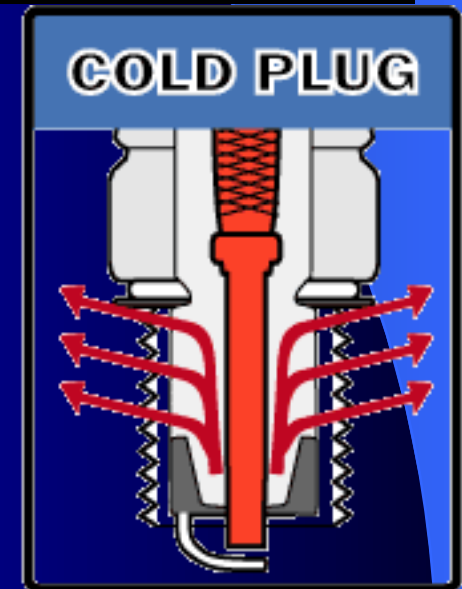
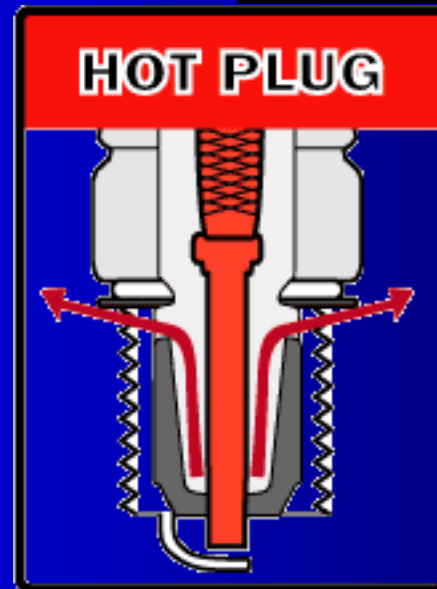
# Engines

## Spark Plug

It provides the means of ignition when the gasoline engine's piston is at the end of compression stroke, close to Top Dead Center(TDC)



The difference between a "hot" and a "cold" spark plug is that the ceramic tip is longer on the hotter plug.

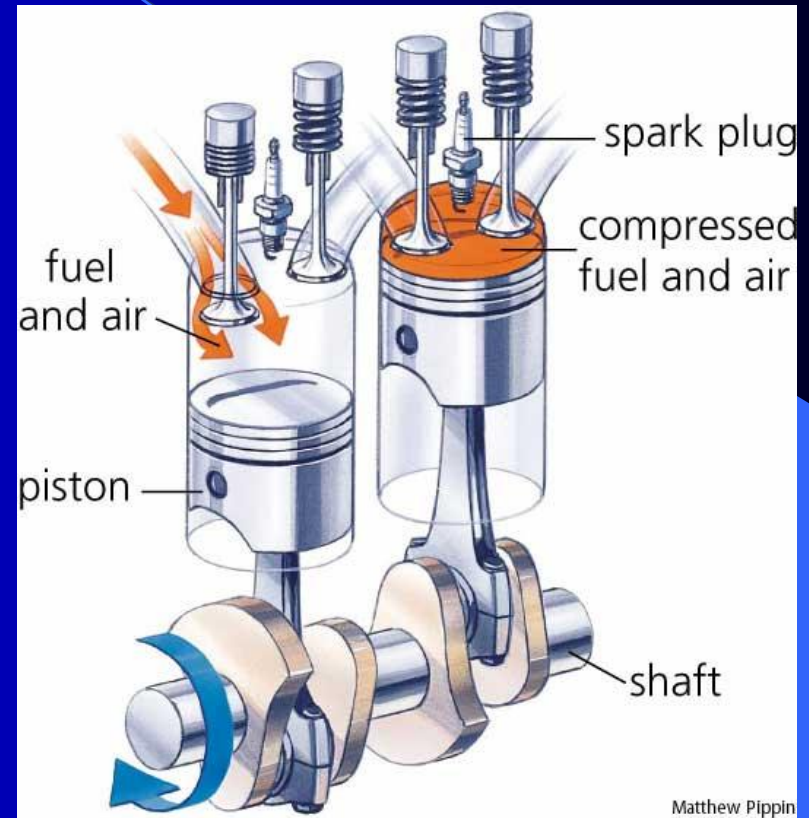


# Engines

## Piston

A movable part fitted into a cylinder, which can receive and transmit power.

Through connecting rod, forces the crank shaft to rotate.





# Engines

## Cylinder head

Part that covers and encloses the Cylinder.

It contains cooling fins or water jackets and the valves.

Some engines contains the cam shaft in the cylinder head.



# Engines

## Engine Block

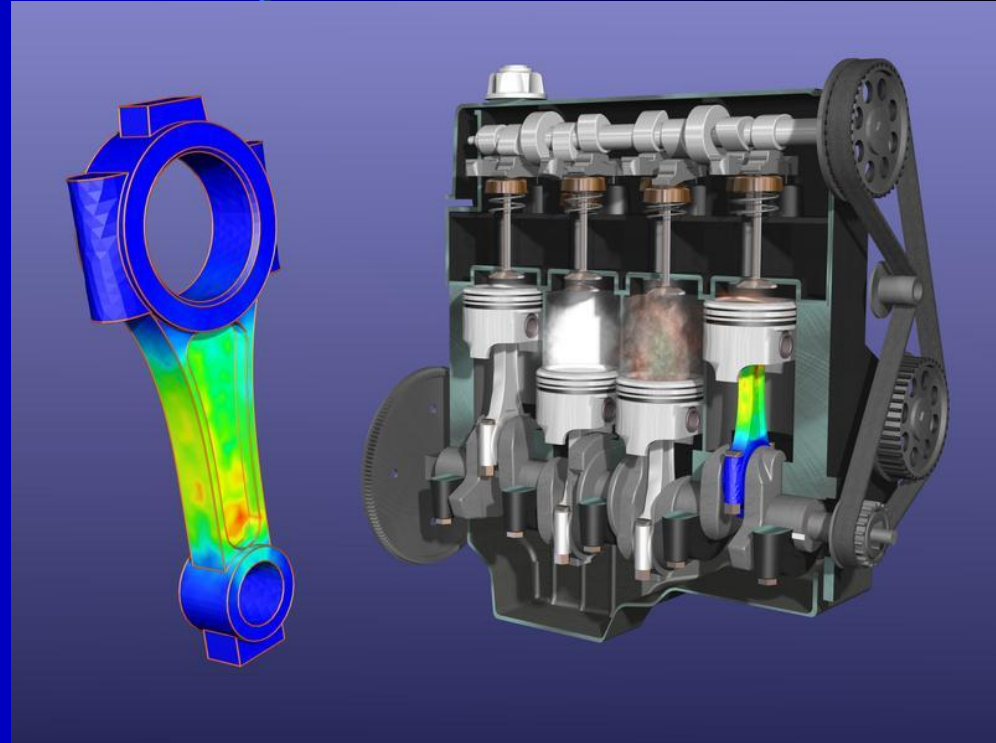
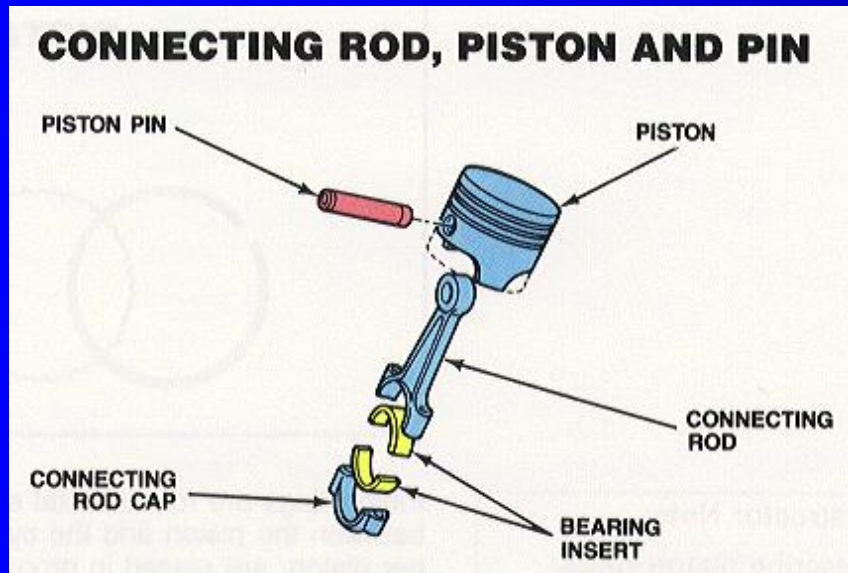
Foundation of the engine and contains pistons, crank shaft, cylinders, timing sprockets and sometimes the cam shaft.



# Engines

## Connecting (conn.) Rod

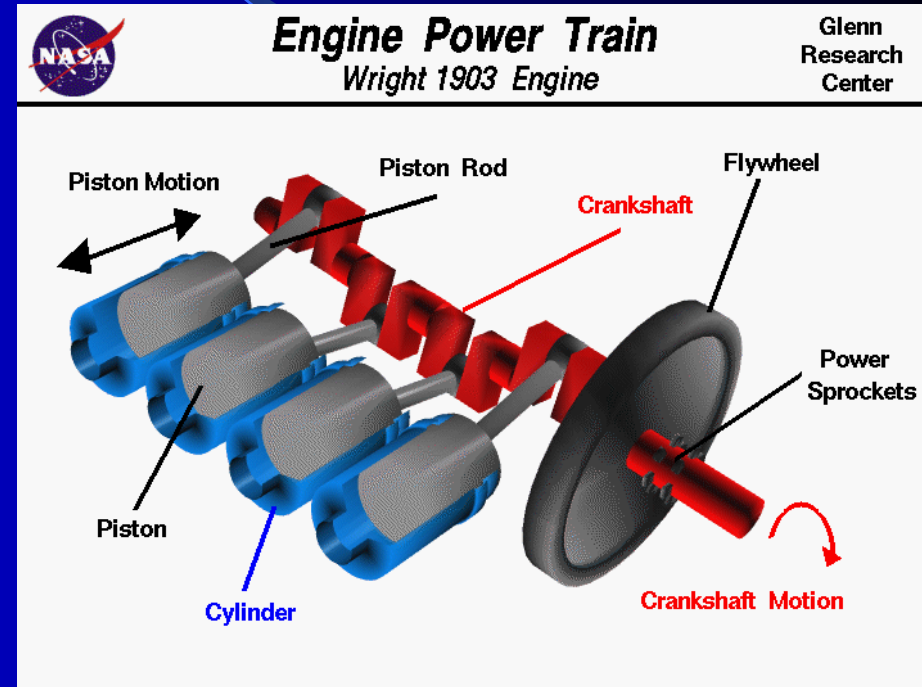
Attaches piston (wrist-pin) to the crank shaft (conn. rod caps).



# Engines

## Crank Shaft

Converts up and down or reciprocating motion into circular or rotary motion.



**DAMPNER PULLEY**  
Controls Vibration

# Engines

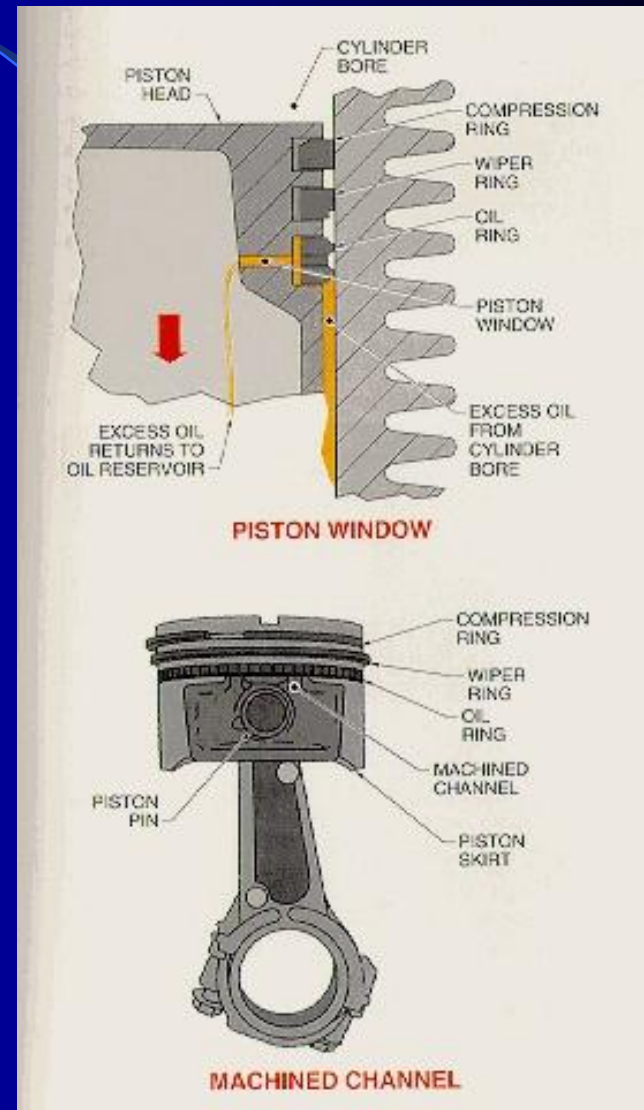
## Piston Rings

*Four stroke:* Three rings

Top two are compression rings (sealing the compression pressure in the cylinder) and the third is an oil ring (scrapes excessive oil from the cylinder walls)

*Two Stroke:* Two Rings

Both the rings are Compression rings.



# Engines

## Flywheel

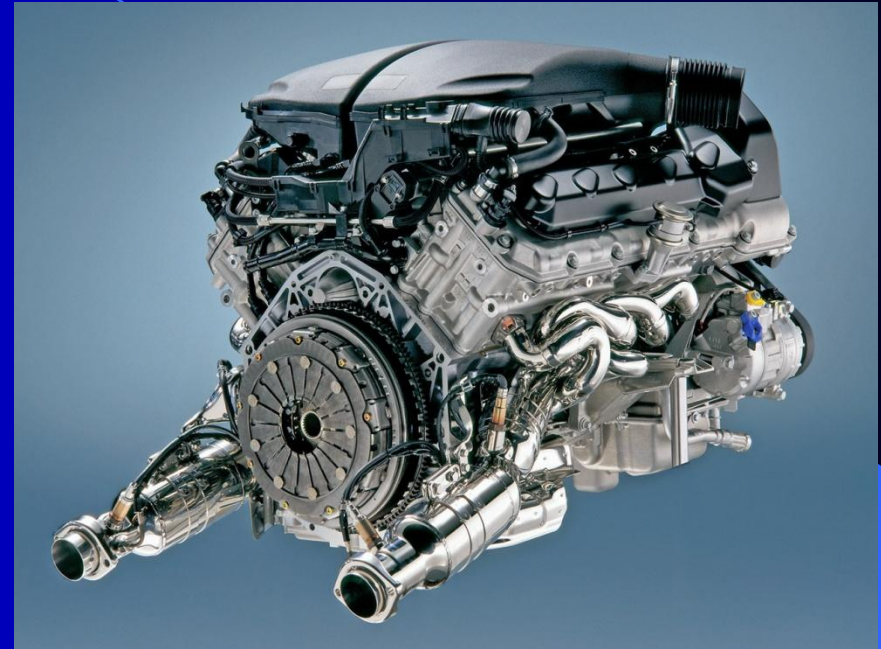
Attached to the crankshaft

Reduces vibration

Cools the engine (air cooled)

Used during initial start-up

Transfers power from engine to drivetrain



# Engines

