

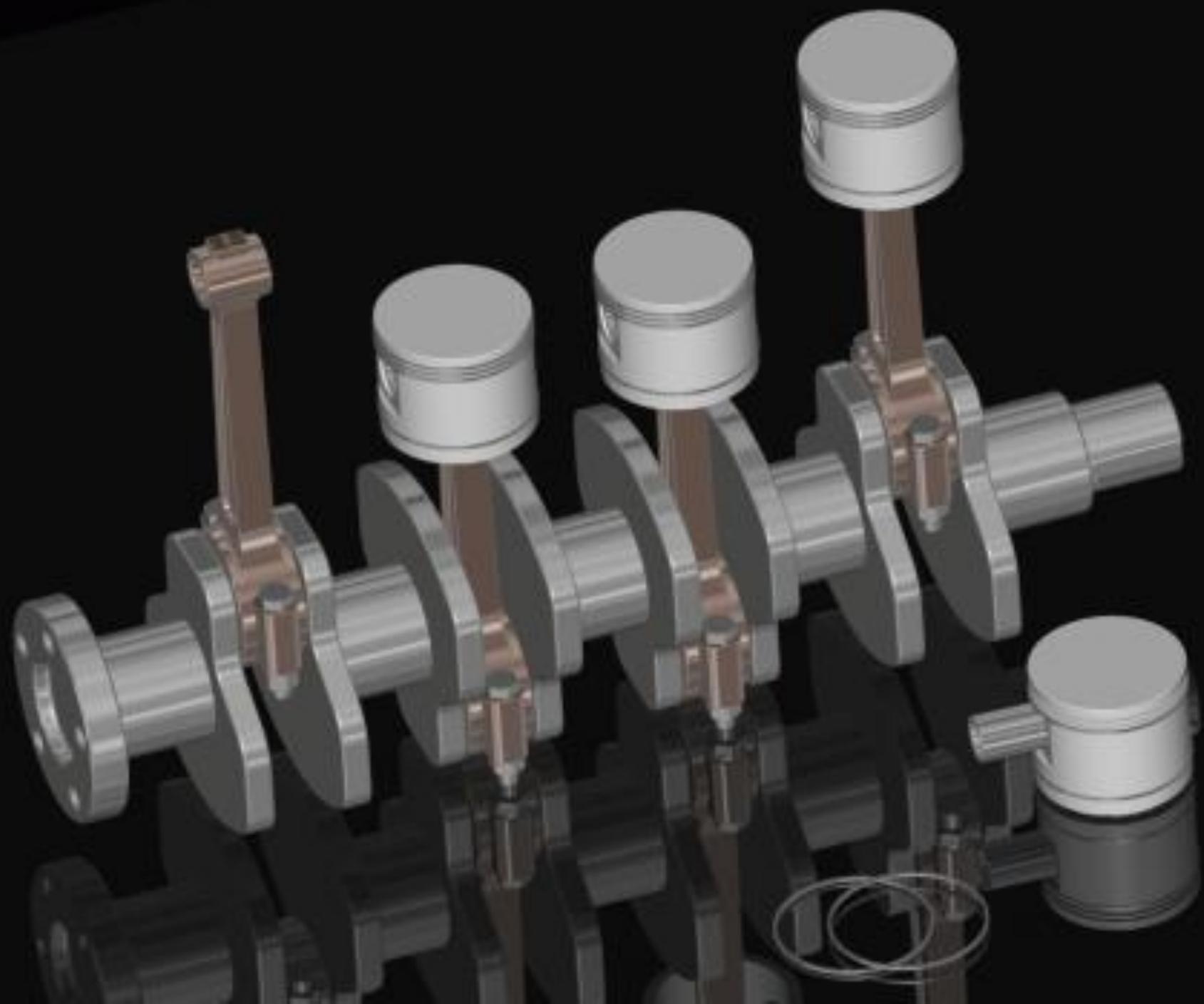


Politechnika Wroclawska

Internal Combustion Engine

Lab. 1

Piston-crank system





The function of the piston and crankshaft system

The primary function of the crank-piston system is to convert the reciprocating motion of the piston to the crankshaft rotation.

Engineering solutions of the system vary according to the type of engine: two- or four-stroke engine and diesel or gasoline engine.

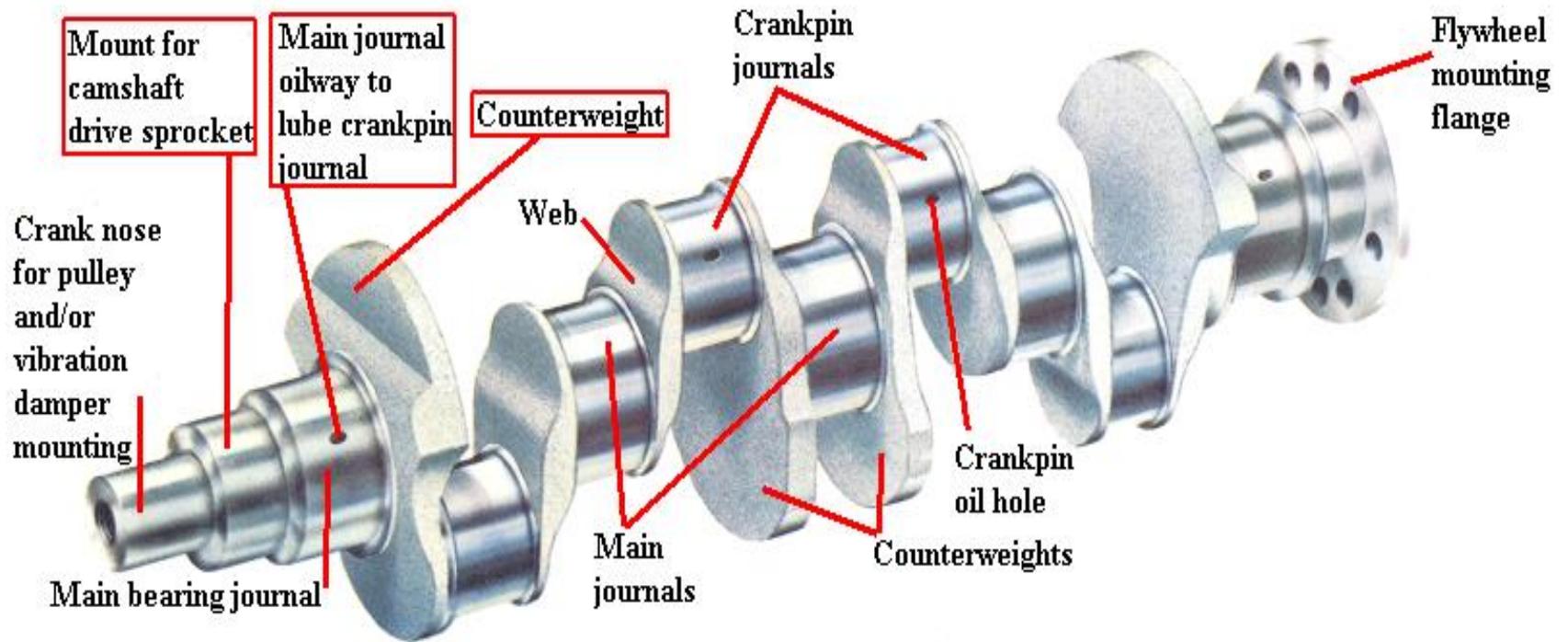


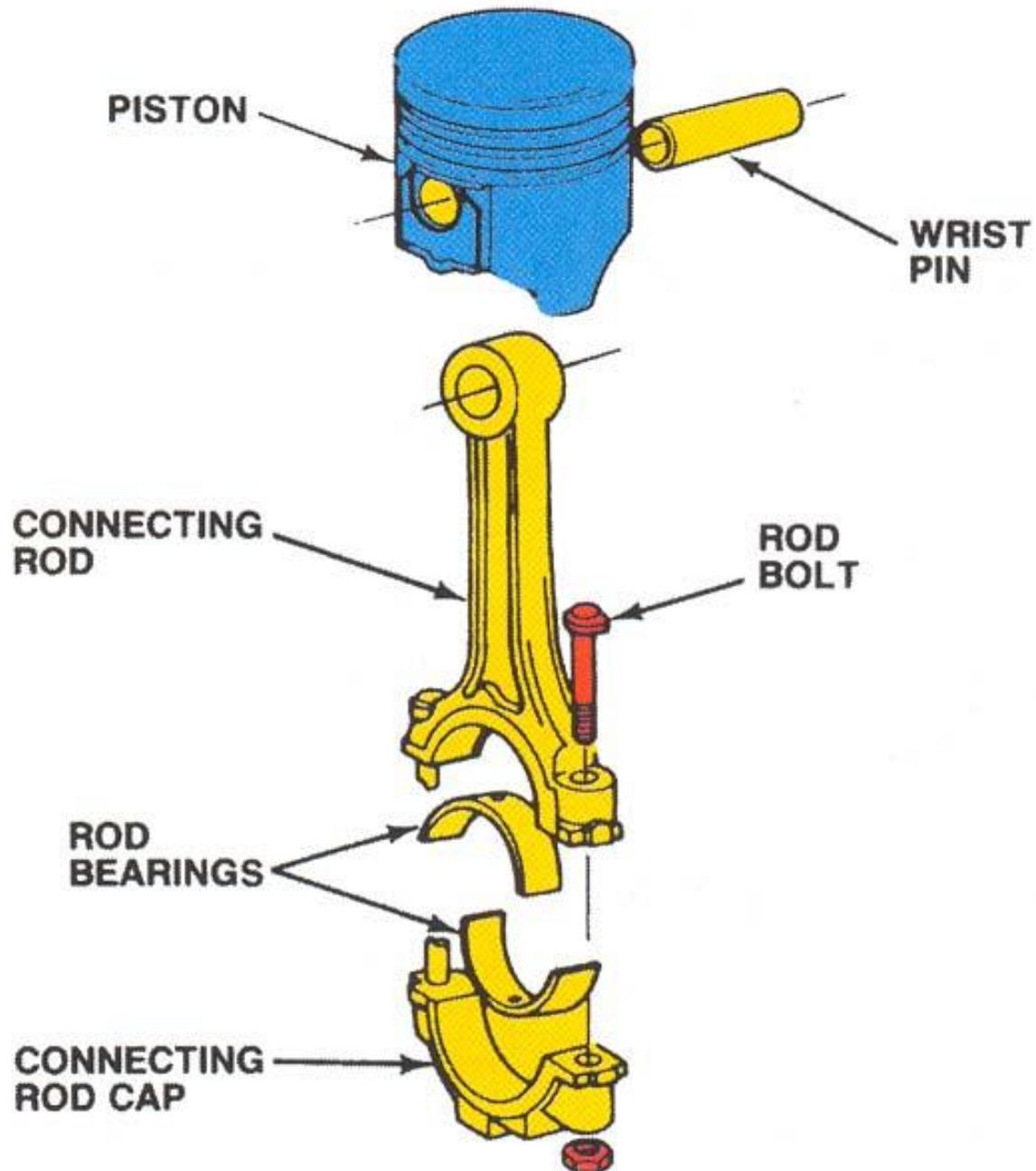
Piston-crank system (crank mechanism)



System components:

- piston
- piston rings
- wrist pin
- the connecting rod
- crankshaft
- crankshaft bearing
- flywheel

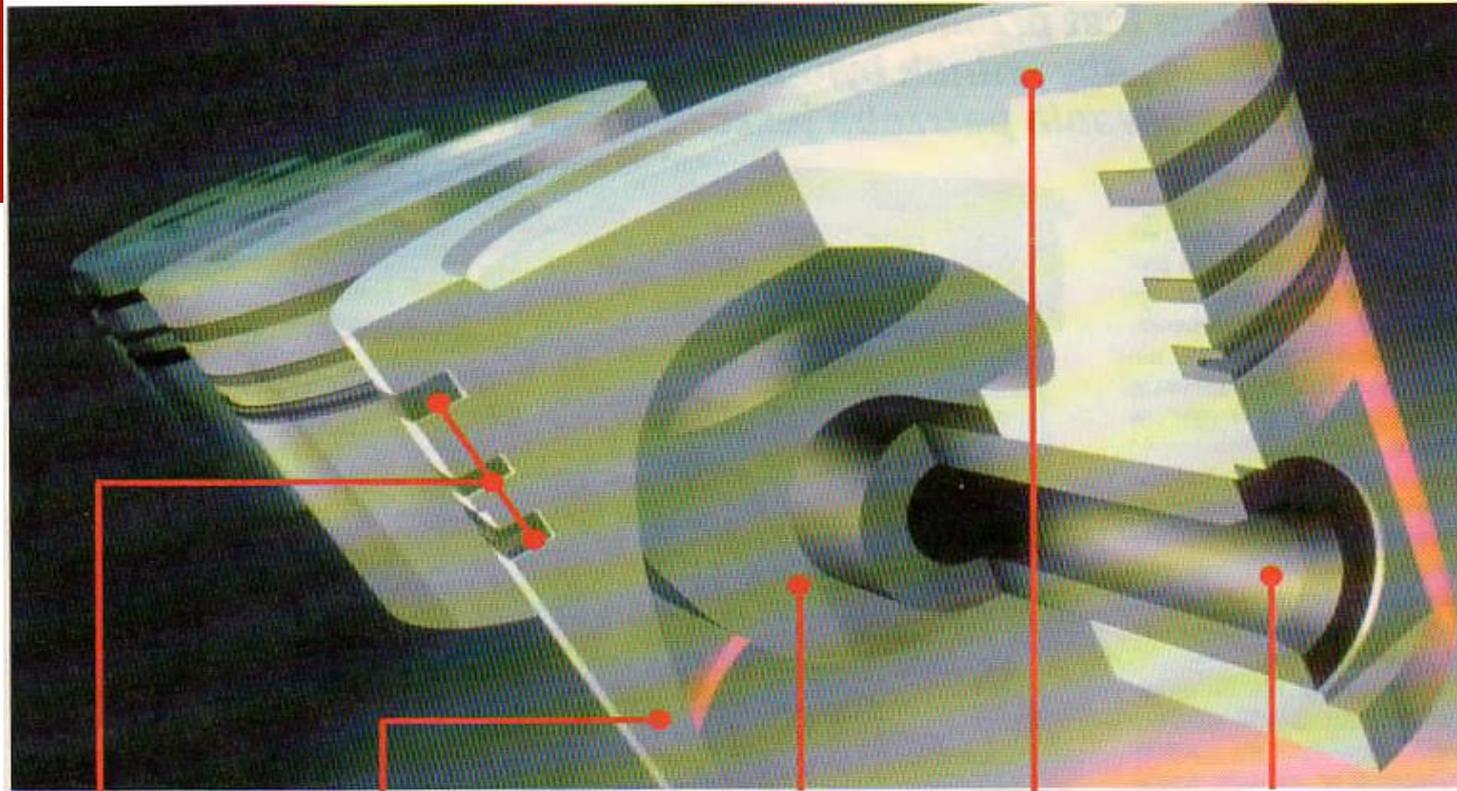






Piston tasks

- Seal the combustion chamber in reciprocating motion,
- Creating space in the bottom of the piston for combustion chamber
- Extracting a large amount of heat generated during combustion on the cylinder walls,
- Guiding the connecting rod at the top,



Piston rings: 2 sealing rings, 1 scraper

Skirt of the piston: it leads the piston inside the cylinder in its original position. The skirt is longer than the engine runs quieter.

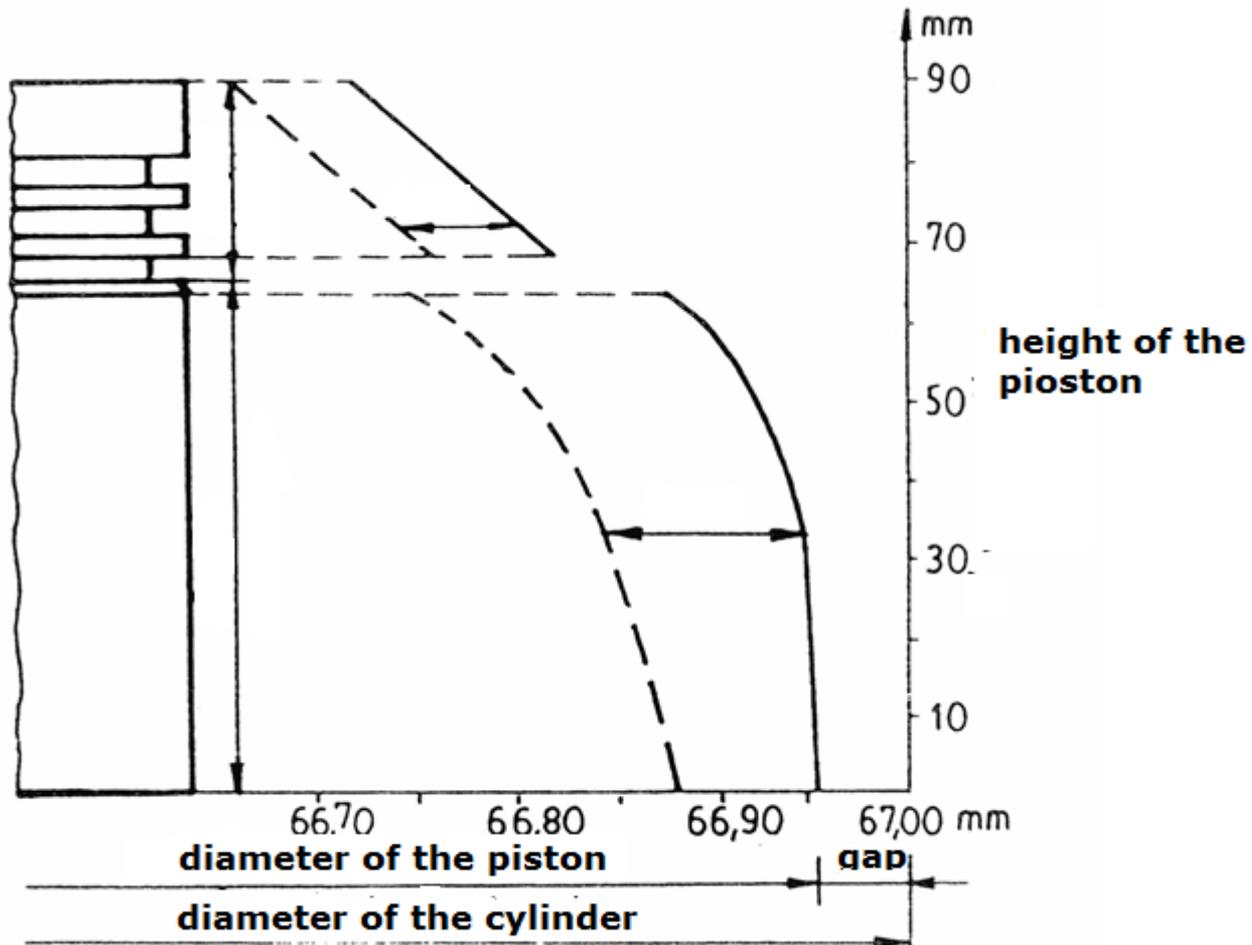
Pin boss, strengthening the internal parts of the piston,

The piston head, the passage of the piston is most strongly charged by heat and pressure

Pin piston transmits the force and the translational movement of the piston to the connecting rod, and then further to the crankshaft

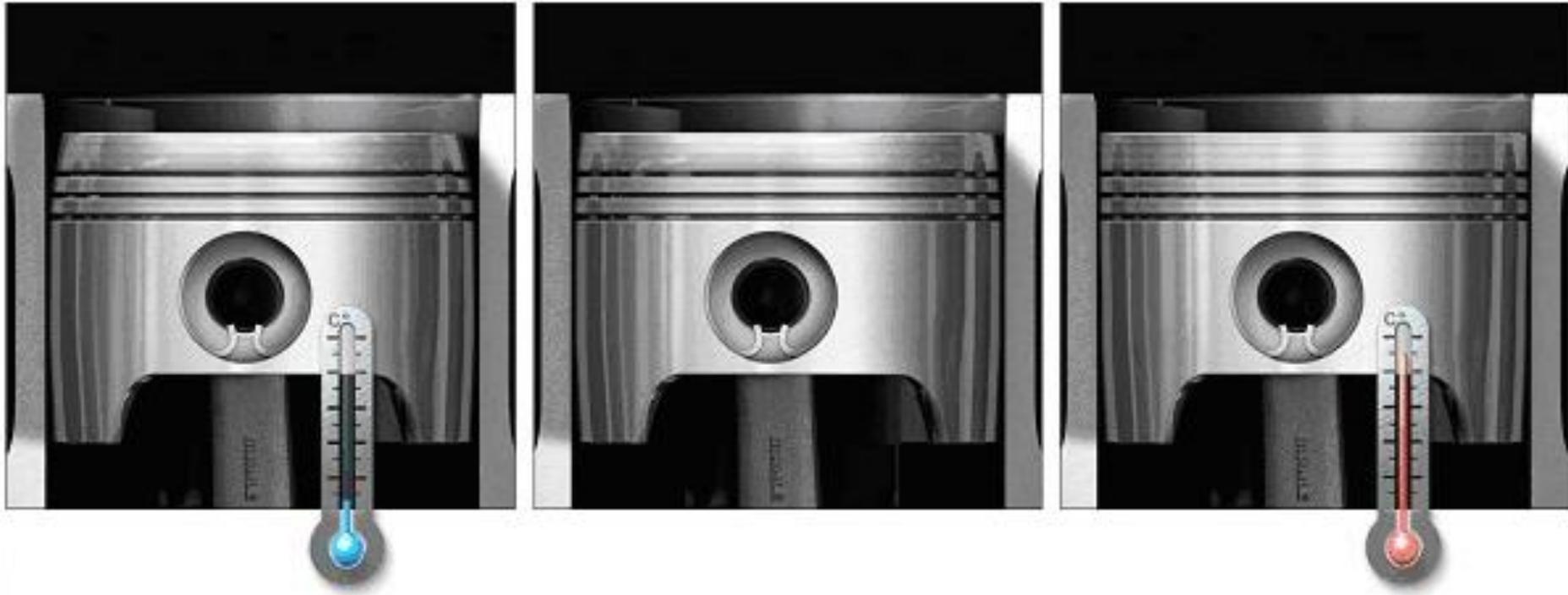


Roundness



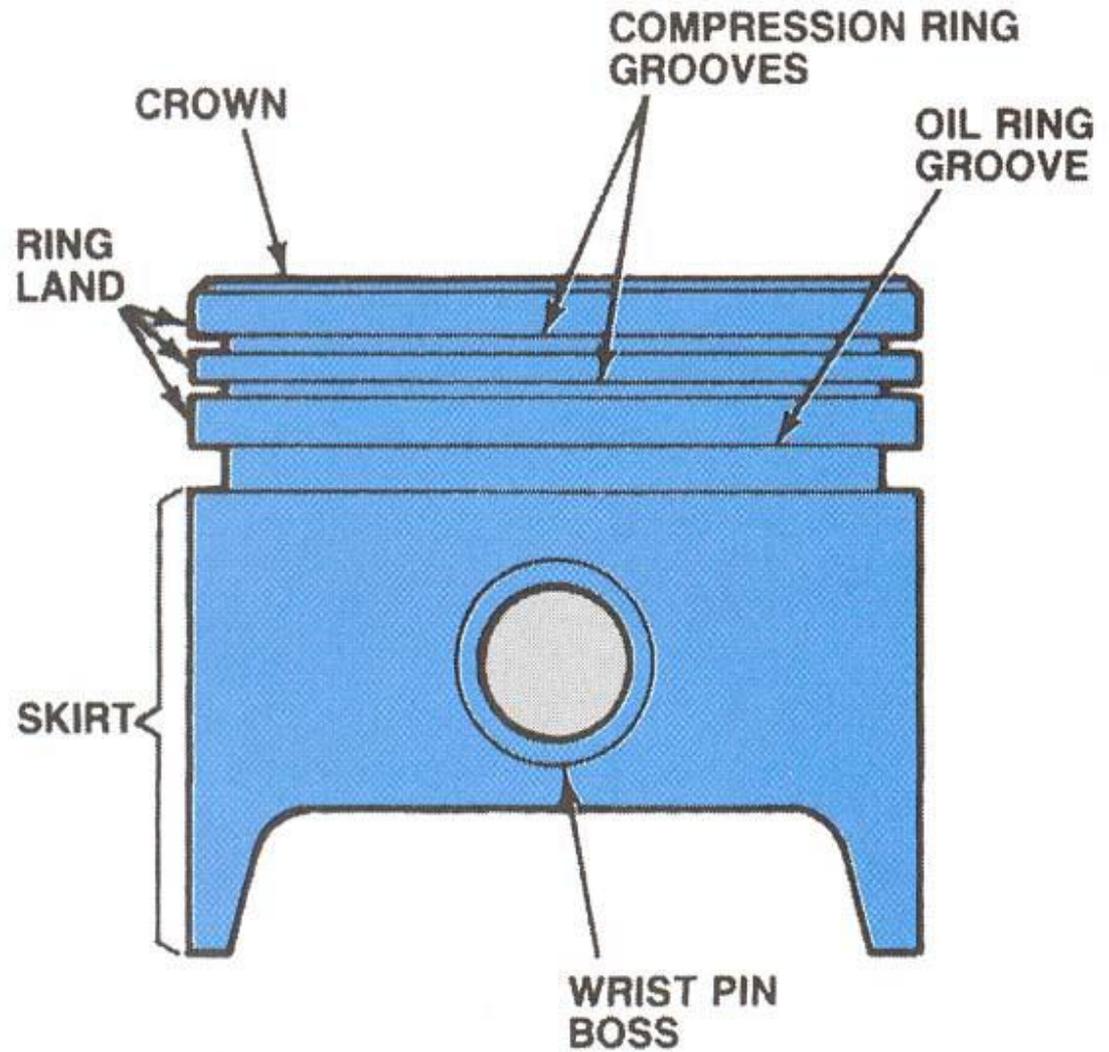


Thermal deformation



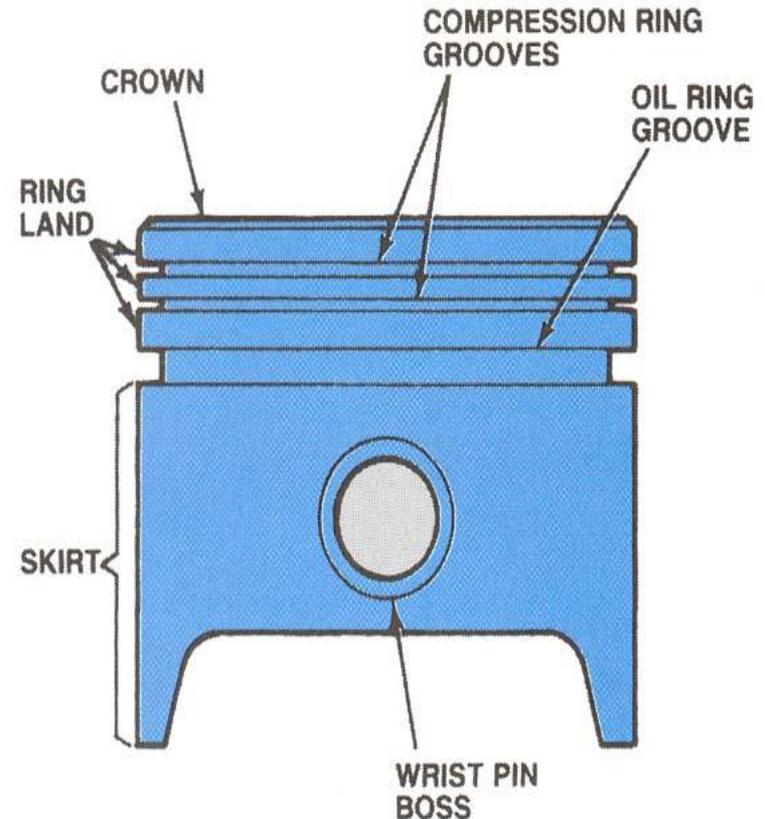


modified





- **The Crown :** is the top surface (closest to the cylinder head) of the piston which is subjected to tremendous forces and heat during normal engine operation.
- **The Ring lands :** Are the reliefs cut into the side profile of the piston where the piston rings sit.
- **Ring Groove:** is a recessed area located around the perimeter of the piston that is used to retain a piston ring.
- **Skirt :** of a piston is the portion of the piston closest to the crankshaft that helps align the piston as it moves in the cylinder bore.
- **Wrist pin boss :** is a bore that connects the small end of the connecting rod to the piston by a wrist pin.





Piston rings

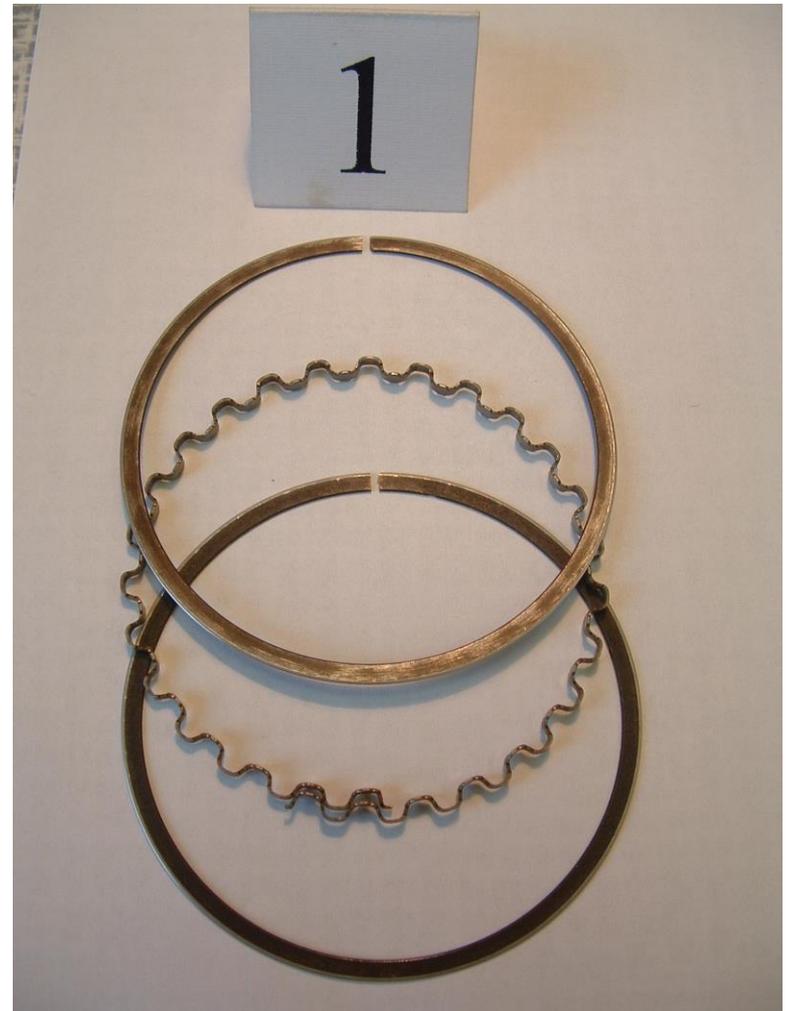
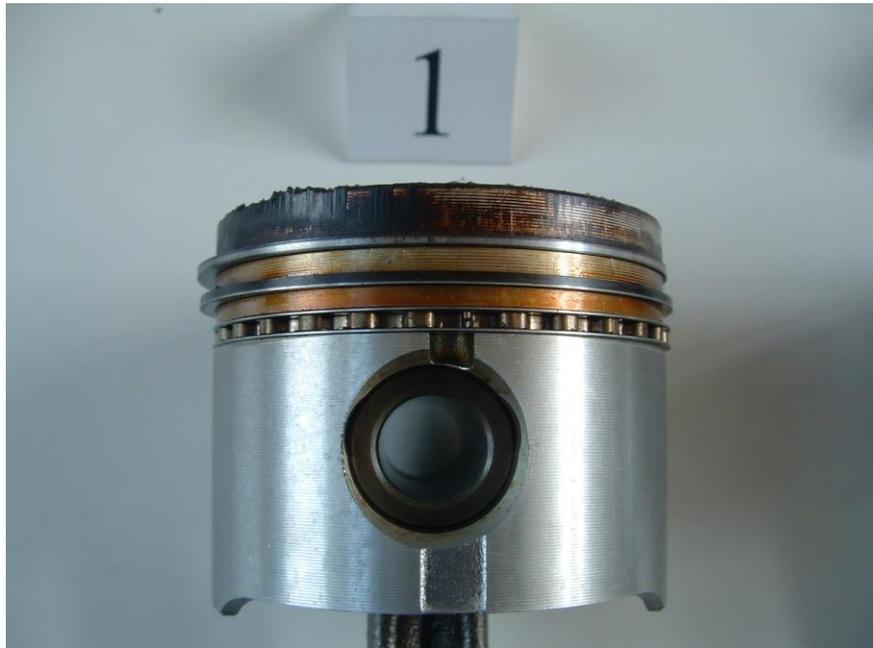
A *piston ring* is an expandable split ring used to provide a seal between the piston and the cylinder wall.

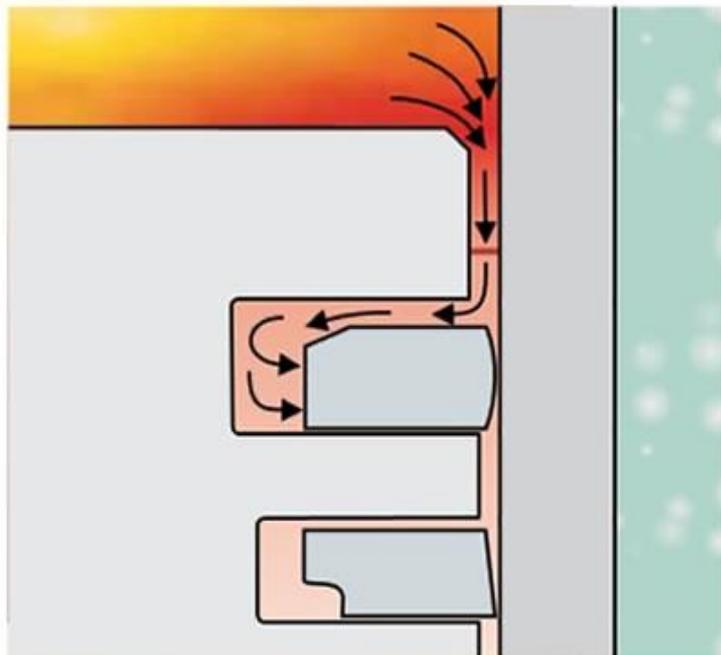
Piston rings commonly used include the compression ring, wiper ring (second compression ring), and oil ring.

Compression ring and wiper ring seals the combustion chamber from any leakage during the combustion process.

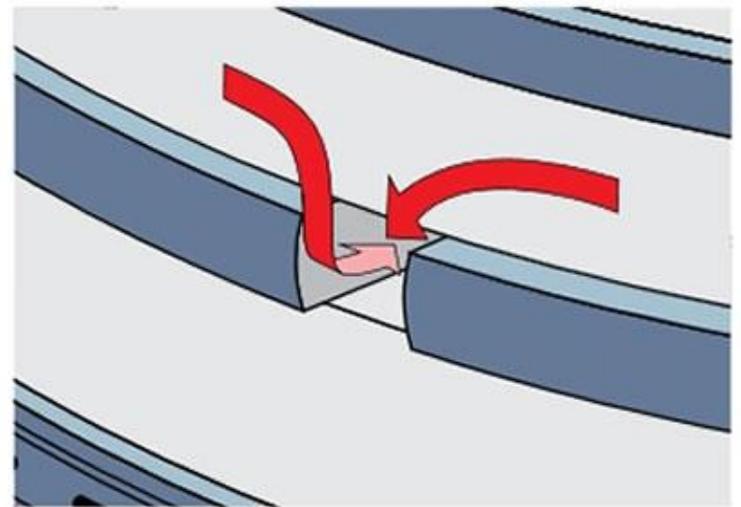
The oil ring is used to distribute and regulate oil within the cylinder wall and help scrape it back into the crankcase







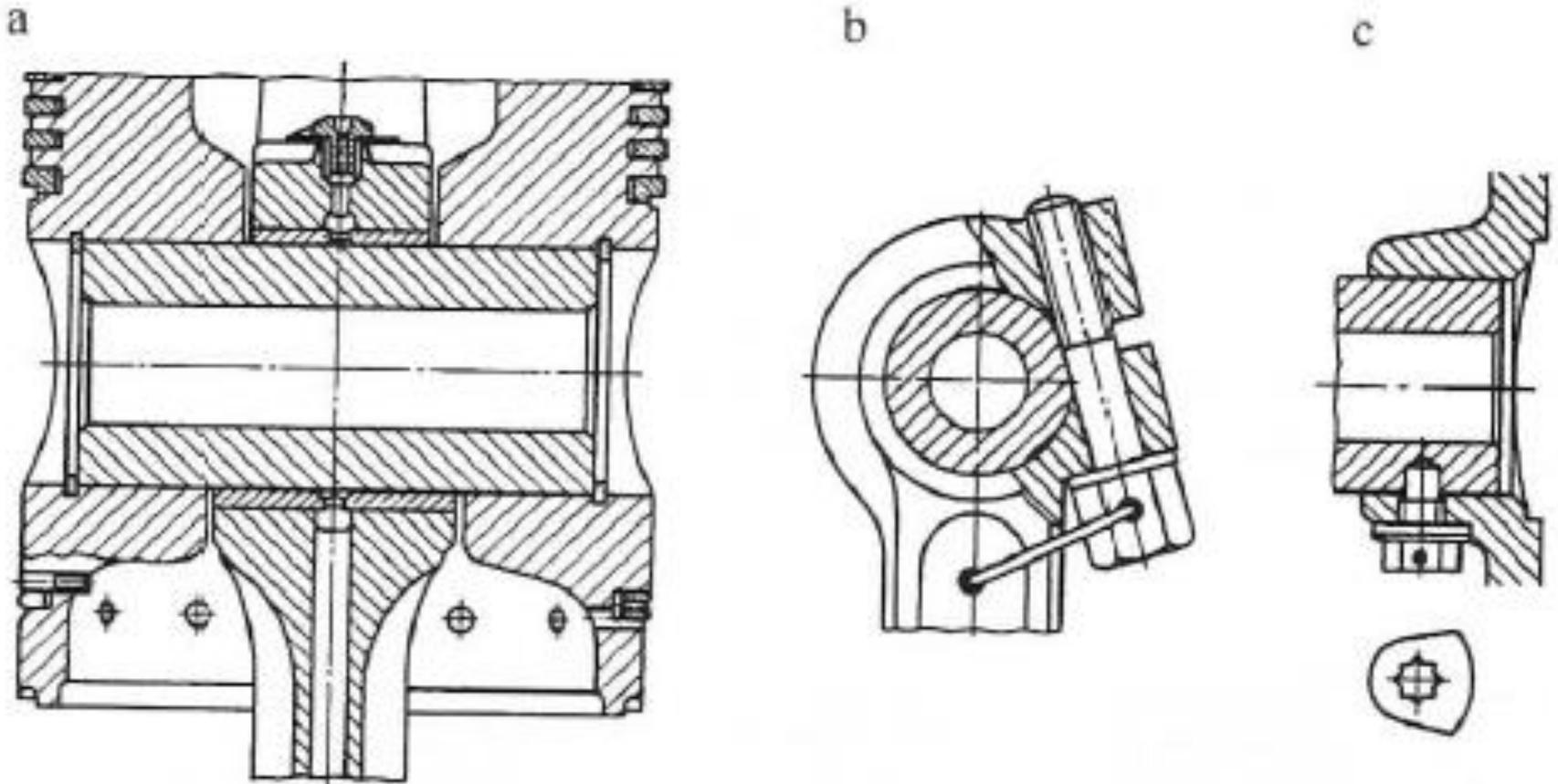
Rys. 1



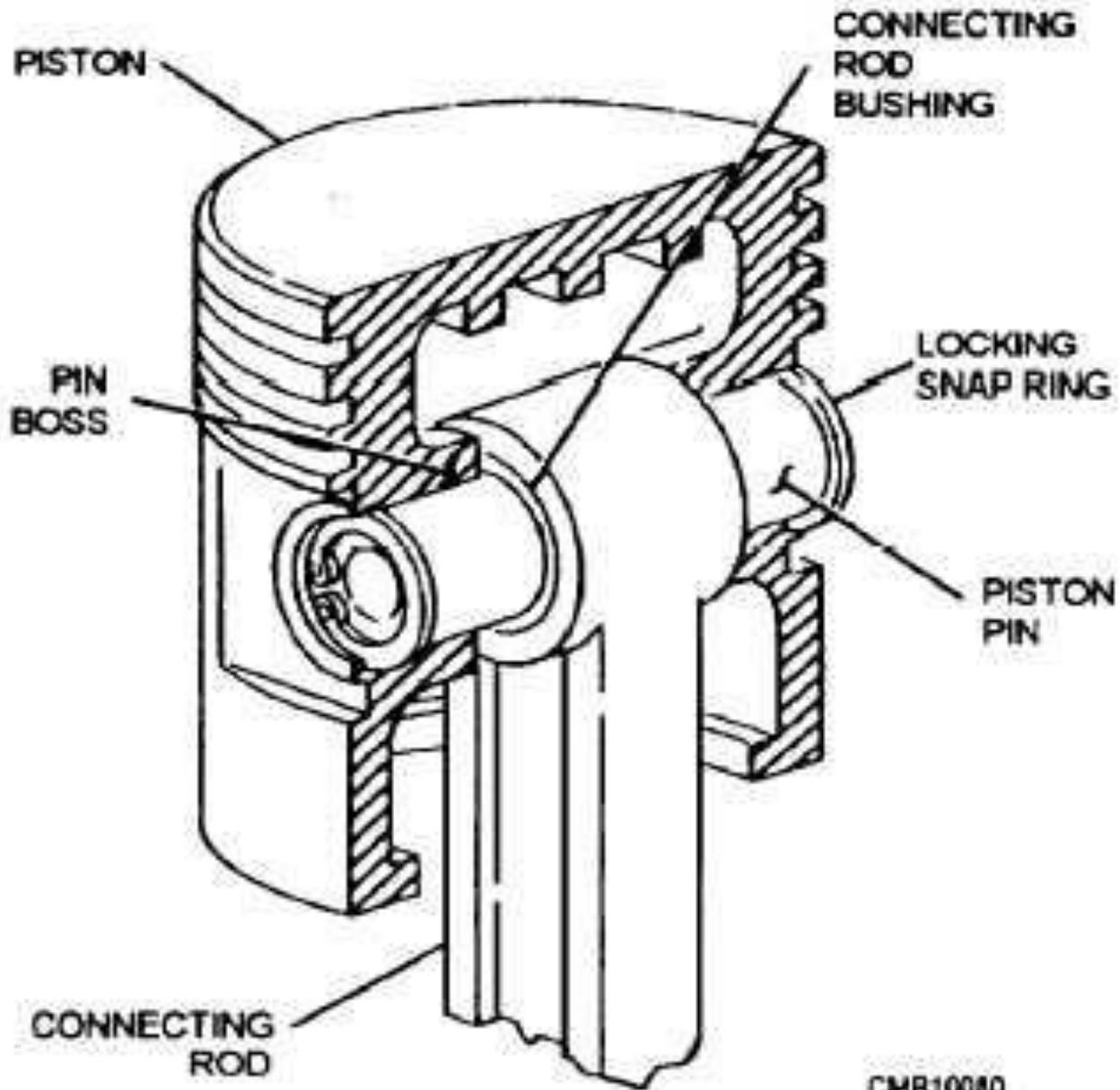
Rys. 2



Deposition methods of the pin



a) swimming, b) in head of connecting rod, c) in bearing of the piston



Connecting rod

Works:

- Connection of the piston with the crankshaft,
- Conversion of the reciprocating motion of the piston to the rotation of the crankshaft,
- Transfer of tensile forces from the piston inertia forces and reciprocating part of the connecting rod

