

TECHNICAL UNIVERSITY OF KOŠICE Faculty of Mechanical Engineering

AUTOMOBILE DESIGN

Part no: **8L**

Lecturer: prof. Ing. Robert Grega, PhD.

Lubrication of internal combustion engines

Lubrication missions:

- provide the necessary oil film between the moving parts so that it does not seize,



-dissipate heat from places that cannot be cooled by the main circuit,

- seal the contact surfaces,
- protection of metal parts against corrosion,
- shock absorption in the engine mechanism,
- use of pressure energy for engine control operations e.g. valve clearance definition.



Lubrication circuit scheme

Oil consumption:

- specific [g.kW-1.h-1] up to 0.2
- total [kg, dm3]
- e.g. from exchange to exchange

Oil consumption depends on:

- technical condition of the engine,
- engine design,
- engine loads (deformation of solid parts)
- engine speed,
- engine cooling
- oil quality.



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- Oil degradation:
- thermal degradation,
- diluting the oil,
- aging,
- dust, fumes, carbon, metal particles.

Lubrication systems

1.) pressure lubrication (using an oil pump under the crankshaft - from oil pan then socalled wet lubrication, from a special tank - dry oil pan - so-called dry lubrication)

- 2.) lubrication by spraying oil mist protrusions on the connecting rod.
- 3.) mixed
- 4.) top lubrication by adding oil to gasoline mixing ratio 1:18 to 1:50,
- 5.) additional and special grease lubrication, etc.



Lubrication from wet oil pan



Supporting study material intended for the internal needs of SjF TUKE. The material was not in the process of review. Study year: **1st** - Masters study

Trochoid pump

vnitřní rotor

vnější rotor



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Internal gear pump



Rotary G pump

Oil cleaners

- coarse cleaners
- fine cleaners under $10 \mu m$

1.) with mechanical dirt trapping

- slotted (100-200 μ m)
- sieves (30-50 µm)
- paper or textile up to 5 μm
- 2.) centrifugal
- speed more than 4500min $^{-1}$ capture 1-2 μm
- with mechanical drive
- with reaction drive



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