SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35.

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A+' Grade

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai.

DEPARTMENT OF AUTOMOBILE ENGINEERING

COURSE NAME : 19AUB301 – AUTOMOTIVE FUELS AND LUBRICANTS

III YEAR / V SEMESTER

Unit 2- Theory of Lubrication

Topic : Function and Design of Lubrication

FUNCTIONS OF LUBRICATING SYSTEM

- Lubricating the parts
- Cooling
- Cleaning
- Sealing
- Reducing Noise

DESIGN OF LUBRICATION SYSTEM

- The primary purpose of the lubrication system is to lubricate sliding surfaces and reduce friction losses in the engine.
- Basic lubrication systems use a positive displacement oil pump feeding all bearings with full flow oil filtration.
- The main factors to be considered in the lubrication system design process are flow balancing and pump sizing required for satisfactory operation.

GENERAL CONSIDERATIONS FOR THE LUBRICATION CIRCUIT

- Typically oil velocities in excess of 3m/s in the pick-up pipe can result in cavitation reducing engine and oil pump life.
- At low temperatures the pressure in the lubrication system is high due to high oil viscosity and a majority of the oil is then re-circulated or directed back to sump via the pressure relief valve.
- Aeration is another of concern, which is caused by crankshaft churning, oil break up, high oil return velocities and long suction lengths

GENERAL CONSIDERATIONS FOR THE LUBRICATION CIRCUIT

- If the oil level is too low the pick-up pipe is not fully flooded under all conditions, again causing air bubbles to be mixed with the oil by the oil pump and circulated around the lubrication system.
- For drainage, if the oil velocity is in excess of 0.5m/s, air is mixed into the oil, which is the main reason for re-circulating oil from the pump relief valve rather than directing it straight back to sump at high speed.

GENERAL CONSIDERATIONS FOR THE LUBRICATION CIRCUIT

- Another important criterion to consider is the engine running temperature which ranges from 120°-150°for light duty automotive applications.
- If localized temperatures are too high, i.e. above 220° the oil is likely to carbonize into solid matter, which can accumulate in critical areas of the engine.

REFERENCE

- https://www.sae.org/publications/technical-papers/content/970637/

THANK YOU !!!