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DEPARTMENT OF AUTOMOBILE ENGINEERING

COURSE NAME : 19AUB301 – AUTOMOTIVE FUELS AND LUBRICANTS

III YEAR / V SEMESTER

Unit 3 - Lubricants

Topic : Specific requirement of Lubricants and Test types, Synthetic Lubricants

LUBRICANTS

- Any substance introduced between two moving/sliding surfaces with a view to reduce the friction between them, is known as a **lubricants.**
- The main purpose of a lubricant is to keep the moving/sliding surfaces apart, so that friction and consequent destruction of material is minimized
- The process of reducing friction between moving/sliding surfaces, by the introduction of lubricants in between them, are called lubrication.

FUNCTIONS OF LUBRICANTS

- It reduces wear and tear of the surfaces by avoiding direct metal to metal contact between the rubbing surfaces
- It reduces expansion of metal due to frictional heat and destruction of material
- It acts as coolant of metal due to heat transfer media
- It avoids unsmooth relative motion
- It reduces maintenance cost
- It also reduces power loss in internal combustion engines

CLASSIFICATION OF LUBRICANTS

- Lubricants are classified on the basis of their physical state, as follows;
  - Liquid lubricants or Lubricating Oils,
  - Semi-solid lubricants or Greases
  - Solid lubricants.

SPECIFIC REQUIREMENT FOR AUTOMOTIVE LUBRICANTS

- It should have a high viscosity index.
- It should have flash and fire points higher than the operating temperature of machine.
- It should have high oiliness.
- The cloud and pour points of a good lubricant should always be lower than the operating temperature of the machine.
- The volatility of the lubricating oil should be low.
- It should deposit least amount of carbon during use.
- It should possess a higher resistance towards oxidation and corrosion.
- It should have good detergent quality

SYNTHETIC LUBRICANTS

- It is a lubricant consisting of chemical compounds that are artificially made.
- Synthetic lubricants can be manufactured using chemically modified petroleum components rather than whole crude oil.
- Synthetic oil is used as a substitute for lubricant refined from petroleum when operating in extremes of temperature.

ADVANTAGES OF SYNTHETIC LUBRICANTS

- Higher Viscosity Index (VI)
- Better chemical and shear stability
- Decreased evaporative loss
- Resistance to oxidation, thermal breakdown, and oil sludge problems
- Improved fuel economy in certain engine configurations
- Better lubrication during extreme cold weather starts
- Possibly a longer engine life and
- Superior protection against "ash" and other deposit formation in engine hot spots
- Increased horsepower and torque due to less initial drag on engine

DISADVANTAGES OF SYNTHETIC LUBRICANTS

- Substantially more expensive (per volume) than mineral oils.
- Potential decomposition problems in certain chemical environments

TESTS ON LUBRICANTS

- Basically, there are two different types of lubricant testing
  - Chemico-physical
  - Mechanico-dynamical.
- Chemico-physical tests only concentrate on certain lubricant properties, whereas mechanicodynamical tests try to simulate the effects of load, speed, media and temperature on the friction and wear behavior of a tribo-system.
- Chemico-physical tests generally precede mechanico-dynamical tests.
- Depending on the lubricant type and the requirements there are many different test procedures

REFERENCE

- https://en.wikipedia.org/wiki/Lubricant#:~:text=A%20lubricant%20is%20a%20substance,heating%20or%20cooling%20the%20surfaces.

THANK YOU !!!