



Lecture -9

Aviation Turbine Fuel(ATF)

- It is potential fuel for the gas turbine engines used in aircraft requires high thermal stability, high heat content, low vapour pressure, good combustion characteristics, good viscosity- temperature relation, high density, high specific heat, uniformity and good handling characteristics.
- The combustion properties of ATF are generally controlled using several of the following five tests :
 - Smoke point
 - Luminometer number
 - Aromatic content
 - Aniline point
 - Gravity

Composition of ATF

- Hydrocarbons (major constituent)
- Sulphur
- Nitrogen
- Oxygen
- Traces of particulate matter and water as contaminants

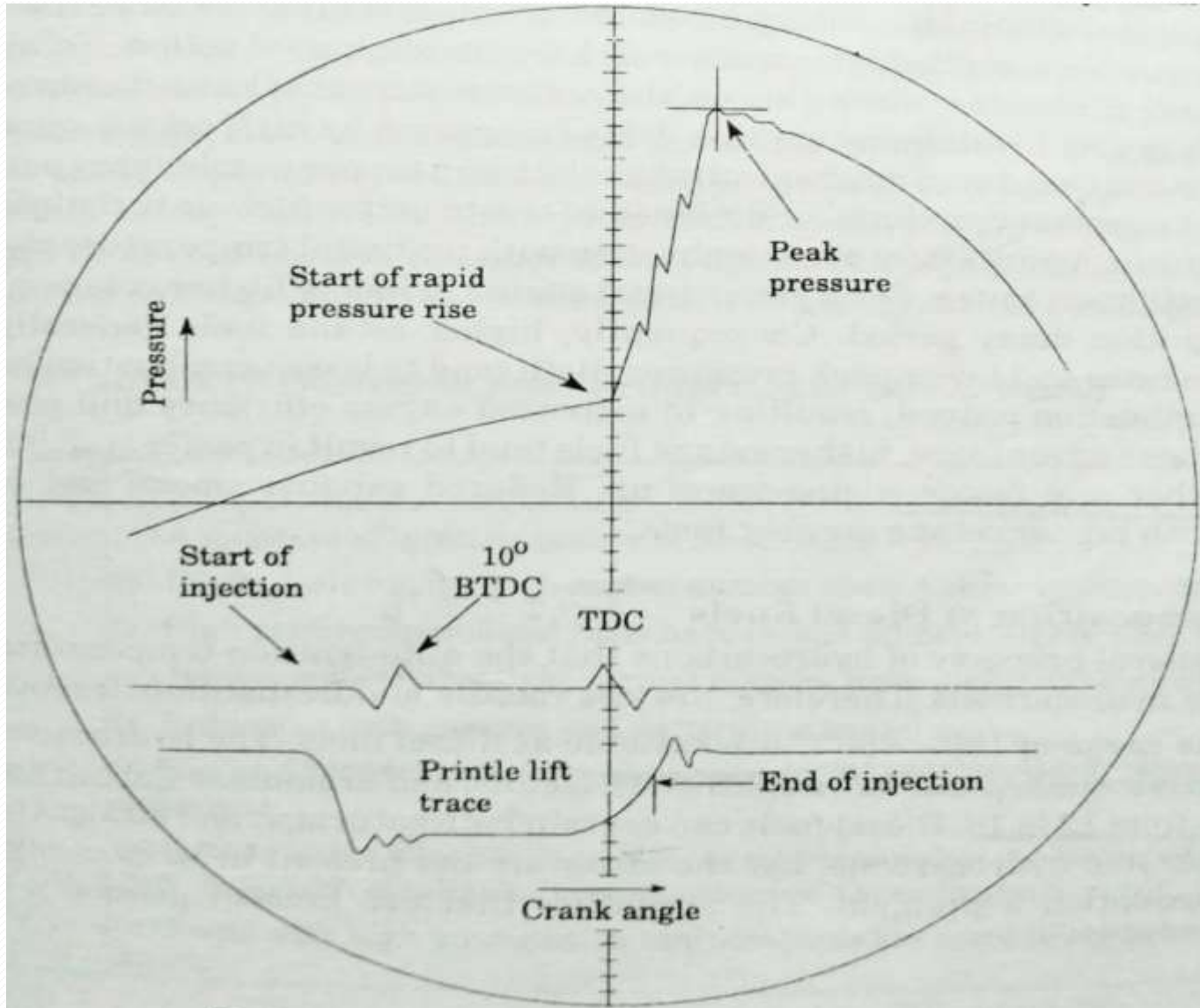
Properties of ATF

- Physical properties
 - Density
 - Viscosity
 - Volatility
 - Auto-ignition temperature
- Thermal properties

Diesel fuels

- Diesel fuel in general is any liquid fuel used in diesel engines, whose fuel ignition takes place without any spark, as a result of compression of the inlet air mixture and then injection of fuel.
- Most common type of diesel fuel is a specific fractional distillate of the petroleum fuel oil.
- But the alternatives that are not derived from the petroleum , such as biodiesel, biomass to liquid(BTL) or gas to liquid(GTL)diesel, are increasingly being developed and adopted.

Compression-Ignition(Diesel) Engine



Composition of Diesel fuels

- Hydrocarbons (primarily parafins)
 - Iso-parafins
 - Cyclo-parafins
- Aromatics hydrocarbons
 - Naphthalene
 - Alkylbenzene

Properties of Diesel fuels

- Ignition quality : cetane number and cetane index
- Density(and gravity)
- Heating value
- Volatility(distillation temperature)
- Viscosity
- Heat of combustion
- Particulate matter
- Ash content
- Cloud point, pour point, cold-filter plugging point

Alternative Diesel fuels

- Vegetable oil and their derivatives
- Petrocrops
- Coal
- Agricultural waste



Thank you