

LECTURE 32– MAINTENANCE OF FLUID POWER SYSTEMS

FREQUENTLY ASKED QUESTIONS

1. What is the difference between nominal and absolute ratings of filters

Nominal rating	Absolute rating
The nominal rating is the micron value specified for which 95% of entering particles of size greater than the nominal rating will be trapped	The absolute rating represents the size of the largest opening or pore in the filter and thus indicates the largest size particle that could pass through the filter.

2. Name five reasons for the overheating of the fluid in hydraulic system

- 1) Heat exchanger faulty or turned off
- 2) Underutilized component of piping
- 3) Incorrect fluid
- 4) Continuous operation of relief valve
- 5) Overloaded system
- 6) Reservoir size is small (heat transfer area is less)

3. Name four causes of low or erratic pressure

- 1) Air in the hydraulic fluid
- 2) Pressure relief valve set too low
- 3) Pressure relief valve not properly seated
- 4) Leak in hydraulic line.

4. What three devices are commonly used in the troubleshooting of hydraulic circuits

- Flow meters
- Pressure gauges
- Temperature gauges

5. What is the significance of the neutralization number

The neutralization number is a measure of the relative acidity or alkalinity of hydraulic fluid and is specified by PH factor.

6. Name four of the most common causes of hydraulic system breakdown

- 1) Clogged or dirty oil filters
- 2) Leaking seals
- 3) Loose inlet lines which cause the pump to take in air
- 4) Inadequate supply of oil in the reservoir

7. Explain how cavitation causes damage to the hydraulic pumps

As the vapour bubbles are exposed to the high pressure at the outlet port of a pump, the bubbles are collapsed thereby creating extremely high local fluid velocities. Thus high velocity fluid impacts on internal metal surfaces of the pump. The resulting high impact forces, cause flaking or pitting of the surfaces of the internal components such as gear teeth, vanes, pistons. This results in premature pump failure.

8. Name four locations where filters can be typically installed in hydraulic systems

- Proportional flow filter in separate drain line
- Full flow filter in suction line
- Full flow filter in pressure line
- Full flow filter in return line

9. List eight recommendations that should be followed for properly maintaining and disposing of hydraulic fluid

- 1) Select the optimum fluid for the application involved
- 2) Utilize a well designed filtration system to reduce contamination and increase the useful life of fluid
- 3) Follow proper storage procedure of the unused fluid supply
- 4) Transporting of fluids from the storage containers to hydraulics systems, should be done carefully since the chances for contamination increase greatly with handling
- 5) Operating fluids should be checked regularly for viscosity, acidity, bulk modulus, specific gravity, water content, color, additive levels, concentration of metals and particle contamination.
- 6) The entire hydraulic system including pumps, piping, fittings, valves, solenoids, filters, actuators and reservoir should be maintained according to manufacturer's specifications.
- 7) Corrective action should be taken to reduce or eliminate leakage from operating hydraulic system
- 8) Disposal of fluids must be done properly.

10. Name three disadvantages of fire resistant fluids.

1. Special paints must be used
2. Incompatibility with most natural or synthetic rubber seals
3. High costs