Unit II

ROTARY ACTUATORS

- GEAR MOTOR
- VANE MOTOR
- PISTON MOTOR

- **Rotary actuators** (Hydraulic motors)- Produces **continuous rotational motion**-Pump shaft is rotated to generate flow, a motor shaft is caused to rotate by fluid being **forced into the driving chambers**
- **Semi rotary actuators-**

  Produces non-continuous rotational motion- Limited to less than one revolution (<360°)- Used to produce oscillatory motions in mechanisms

Questions

1. What is an actuator?
2. How do you classify actuator?
3. What are the applications of cylinder?
4. How single acting cylinder is retracted?
5. Compare single and double acting cylinder.
6. Why double acting cylinders are preferred over single acting cylinder?

Summary

- ✓ *The **actuators** are the devices used for converting hydraulic energy into mechanical energy, and therefore have a function opposite to that of pumps.*

- ✓ ***Types of hydraulic actuators :** Based on the type of motion actuators produce, they are categorized into :*

  1. *Linear actuators (also called 'hydraulic cylinders'), and*
  2. *Rotary actuators (also called 'hydraulic motors')*
     - *(a) Continuous rotary actuators, and*
     - *(b) Limited rotation rotary actuators.*

- ✓ *The hydraulic actuators can be used for lifting, tilting, clamping, opening, closing, metering, mixing, turning, swinging, counter balancing, bending, and for many other operations.*

- ✓ *The important **types of hydraulic cylinders** are :*

  1. *Single-acting cylinders,*
  2. *Double-acting cylinders,*
  3. *Telescopic cylinders,*
  4. *Tandem cylinders,*
  5. *Dual linear cylinders, and*
  6. *Through rod cylinders.*

MCQ

1. A ram cylinder can only have_____in one direction.
A.movement B. force C. Rotation

2. A ram cylinder has:
A. a piston with seals to guide it. B. no piston or seals to guide it.
C. a non sealing guide only.

3. The area of a cylinder is figured with the formula:
A. F=PA B. π r2 C. π d2

4. Cylinder force or thrust is figured by the formula:
A. F=PA B. π r2 C. π d2

5. A 2:1 area ratio cylinder has a rod that is:
A. half the diameter of the piston.
B. twice the diameter of the piston.
C. half the area of the piston.

Answer

1. A ram cylinder can only have_____in one direction.
A.movement **B. force** C. Rotation

2. A ram cylinder has:
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5. A 2:1 area ratio cylinder has a rod that is:
A. half the diameter of the piston.
B. twice the diameter of the piston.
C. half the area of the piston.

Higher Order Question

- Identify the usage of cylinders for the following.