

17/11/21

Assignment - 2Power Transmitting Elements

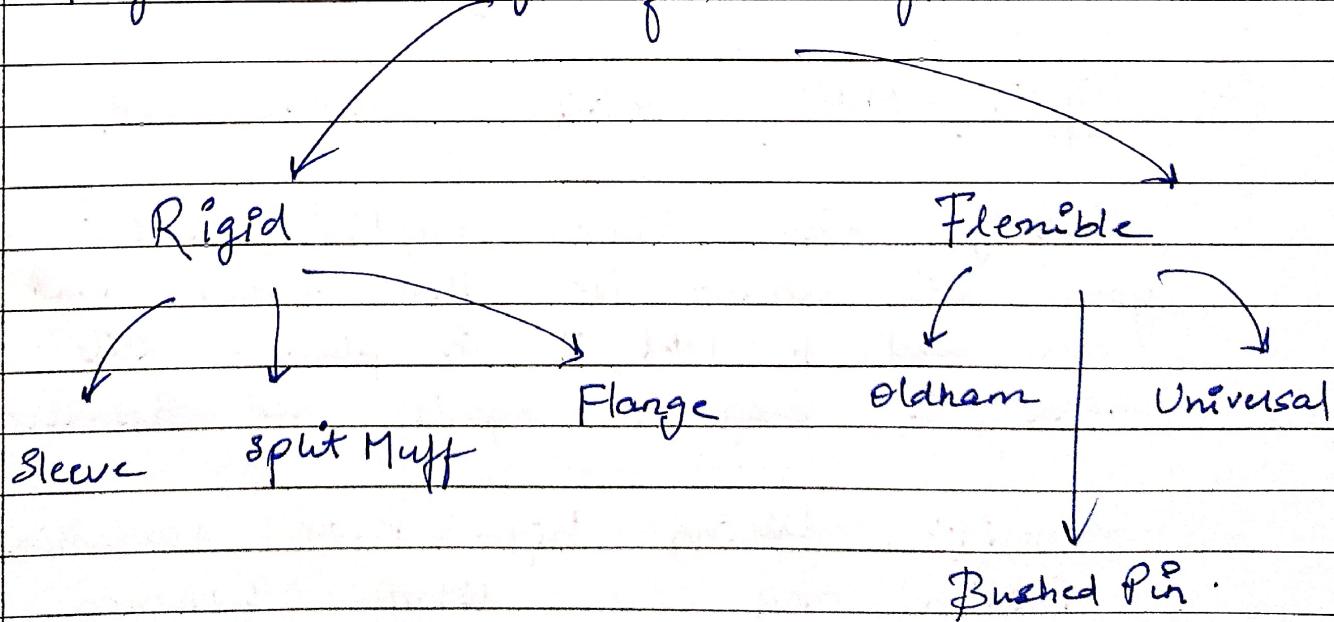
Q.1 Explain function of Couplings with their Type.

→ Coupling is the mechanical element used to connect 2 shafts of a transmission system and transmit the torque from one shaft to another.

Functions :

- (1) Connect 2 shafts
- (2) Introduce Mechanical flexibility and tolerate small misalignment.
- (3) Reduce the transmission of vibration and shocks.

They are mainly of 2 types





Rigid couplings

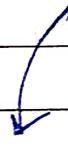
- Connects perfectly aligned shafts
- Doesn't tolerate misalignment.
- Cannot absorb shocks and vibrations
- Simple and cheap

Eg.

① Sleeve coupling

- Cylinder is used as a sleeve over the drive and driven shaft
- Has Friction and can be used for high speed application.

Demerit: Hard to repair and assemble and disassemble.



To fix this demerit, the :

②

Split - Muff coupling can be used

Exactly like sleeve coupling, but you can remove the screws that are used to hold it in place. This makes it easy to repair, and assemble.

Demerit: During high power transmission, friction may cause distance between drive and driven to increase. This reduces efficiency.

So the

③ Flange coupling can be used.

- Keys are used to lock the shafts to a disk called a flange.
- Flanges are then bolted together.
- Doesn't depend on friction.

② Flexible couplings — ① Bush Pin type

- Rubber bushes are used in place of flanges.
- Rubber absorbs vibration and can account for slight misalignment.

② Oldham coupling

- Uses 3 disks, & all have tongue and groove.
- If power increases, middle disk breaks first preventing potential damage.
- Cannot adjust angles.

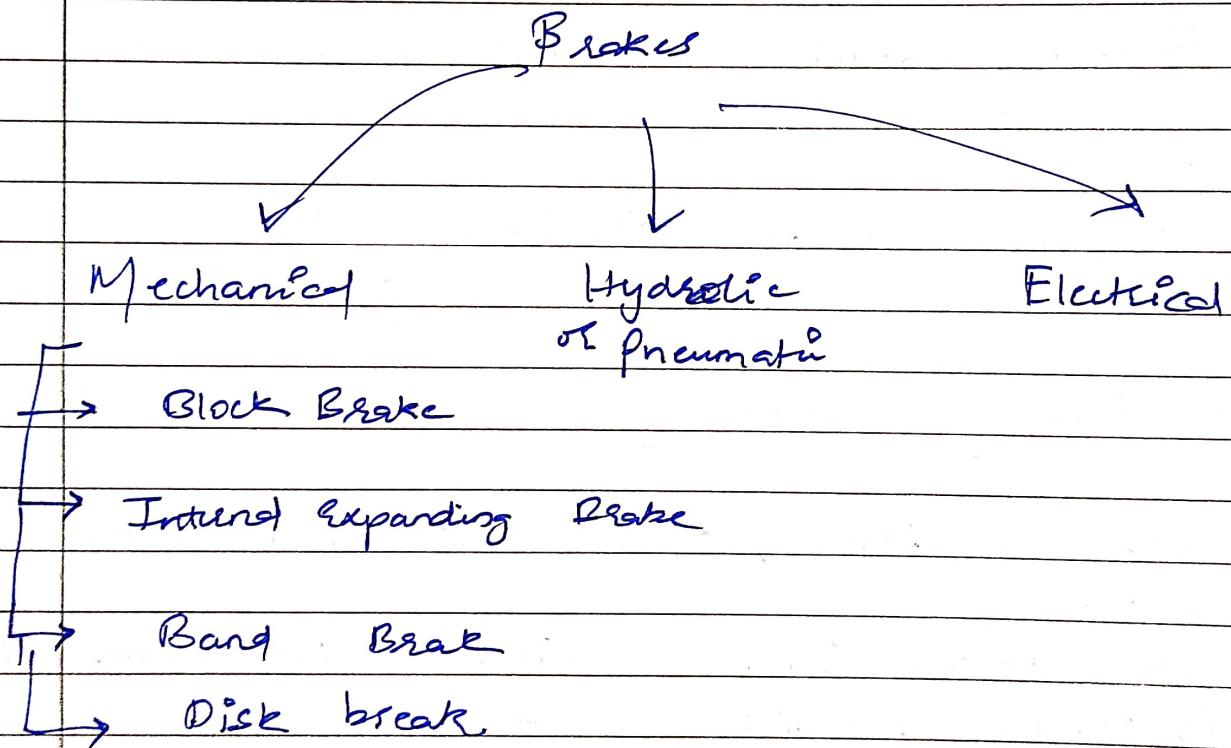
③ Universal coupling

- Pairs of hinges at 90° to each other connected by a cross shaft.
- Can be used on any angle.
- Easy to assemble and disassemble.
- Can transmit high torque.

Q.2 What is brake? Classify break on different basis and explain disk break.

→ Brake is a mechanical device used to absorb the energy possessed by a moving system by creating friction.

→ Basic purpose is to apply a force against, to stop or slow the motion of a machine.



★ Disk Break:

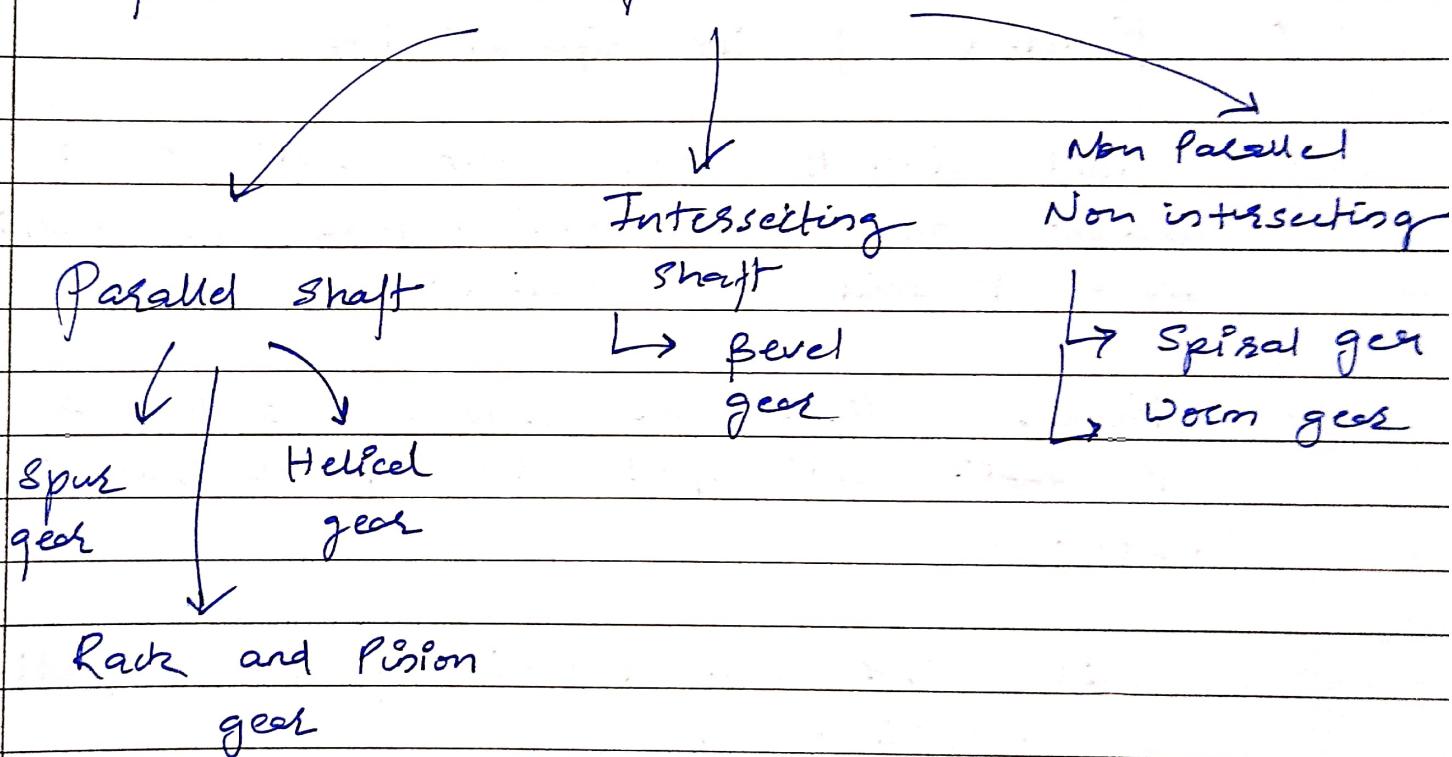
→ Consists of ~~2 disk~~ a disk attached to the main or front wheel, the disks are attached to a Caliper and Piston which compress to press on the disk, stopping it.

When the brake pedal is pushed

break fluid from the master cylinder compresses the brake pads against each other on the rotors attached to the vehicle front wheels. Friction between rotors and pads cause rotors and wheel to slow down.

(Q.3) How are gears classified? Explain spur gear in detail.

Ans. Gears are classified as below:



Spur gear:

→ Spur gears are cylindrical shaped toothed component used in industrial equipment to transfer mechanical motion as well as control speed power and torque. They are simple, cost-effective, durable and reliable.

→ Transmit power from one parallel shaft to another.

Used in electric successors, & oscillating spring like alarm clock, washing machine etc.

Q.4. Define Machine element and its function:

→ A machine element or a kinematic link is any part of the machine that moves relative to one another.

→ Functions of its different types

(1) Rigid elements are those that do not undergo any deformation. They can effectively transmit any motion.

(2) Flexible links can deform slightly so as to not affect the power transmission system.

(3) Fluid links can transmit pressure effectively.
e.g. Hydraulic Presses.

(4) They can function as a lever where a basin link can pivot about a fulcrum.

(5) Other uses are simple mech mechanisms that have specific uses like the scissor lift, slider crank mechanisms, pistons in engines etc.

(6) They form the basis of every mechanism.

Q.5. Differentiate between V belt and flat belt

	V Belt	Flat Belt
①	Highly efficient	less efficiency
②	Slip is very less	Slip is more
③	Pulleys are small	Pulley sizes are large.
④	small centre distance	Large centre distance.
⑤	Cross section is a trapezoid.	Cross section is a rectangle
⑥	Drives are compact	Drives are bulky.
⑦	Only rubber and fabric are used	Leather, cotton, fabric, etc can be used.
⑧	V shape of belt tracks is a mating groove in the pulley so the belt cannot slip off.	There is no mating of grooves so it can easily slip.