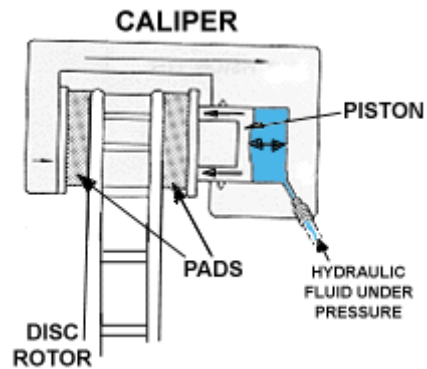
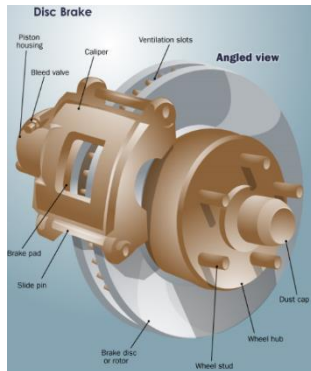


Complex Mechanisms

Brakes



Links:

<https://www.youtube.com/watch?v=swfTwtFcHpg> (bike brakes 10s)

<https://www.youtube.com/watch?v=s2egqlckeO4> (car brakes 1:14)

<https://www.youtube.com/watch?v=Mmls5foCor0> (disc brakes 2:20)

<https://www.youtube.com/watch?v=bnc3VnQ8kUY> (drum brakes 1:26)

Disc Brake Operation

<http://auto.howstuffworks.com/auto-parts/brakes/brake-types/disc-brake.htm>

Advantages - Self adjusting, can connect with additional cable for drum brake in hub

Disadvantages - Can warp, score

Drum Brake Operation

<http://auto.howstuffworks.com/auto-parts/brakes/brake-types/drum-brake1.htm>

Advantages - self adjusting

Disadvantages - scored, grooves in drum from shoe

Clutches

Links

<https://www.youtube.com/watch?v=pqF-aBtTBnY> (clutch 3:59)

Clutch Operation

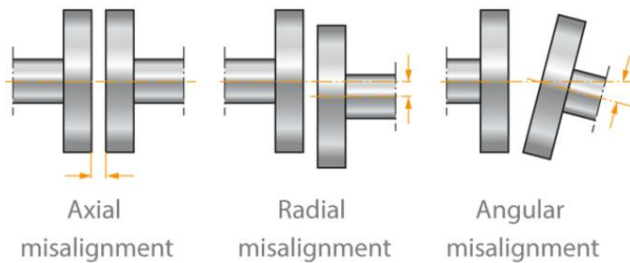
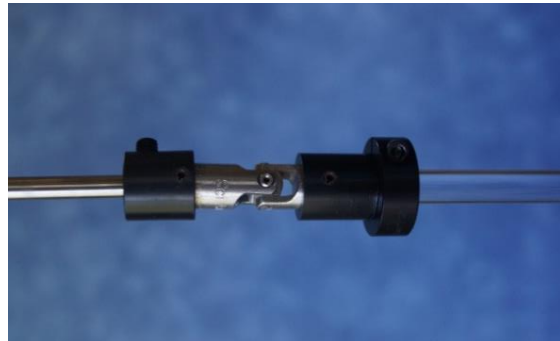
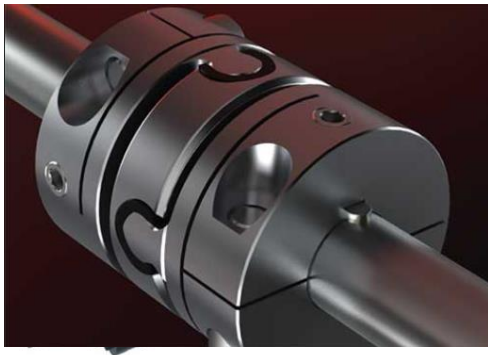
<http://auto.howstuffworks.com/clutch.htm>

Advantages - smoothly engage the drive system

Disadvantages - friction and worn components, slippage, sticking



Couplings



<https://www.youtube.com/watch?v=vr9sWOQo4Yo> (1:55 flexible shaft couplings)

<https://www.youtube.com/watch?v=MkWQ9bAe5dA> (3:26 six different coupling types)

<https://www.youtube.com/watch?v=z5p9SCXrIrE> (1:26 curved jaw couplings)

Advantages – can be used to fix alignment problems

Disadvantages – introduces more parts complicating the design

Bearings



deep groove ball bearing



self-aligning roller bearing



cylindrical roller bearing



self-aligning ball bearing



bearing block



tapered roller bearing



thrust bearing



angular contact ball bearing



needle roller bearing

Links

<https://www.youtube.com/watch?v=RihQOUNsN9c> (0:29 how ball bearings work)

<https://www.youtube.com/watch?v=Jt0ou8Q5Fo8> (1:32 What is a bearing?)

<https://www.youtube.com/watch?v=Q4pXDnSz0Lc> (3:43 Bearing types and applications)

Bearing Operation

<http://science.howstuffworks.com/transport/engines-equipment/bearing.htm>

Advantages and Disadvantages:

ball bearing – only small loading

roller bearing – radial loading

tapered roller bearing – radial loading and thrust

magnetic bearings – float

nylon bearings – self-lubricating, weak