

Hydraulic (fluid) control



Description

Hydraulic (fluid) controlled knees have fluid filled inner chambers which house a sliding piston. The piston seals against the side of the chamber much like a bicycle pump. As the piston moves, liquid (usually silicone oil) is transferred from one chamber to another. The flow of fluid is regulated by control valves which can be adjusted to moderate the bending and straightening resistance of the knee. The movement of fluid allows the user to walk more comfortably at different speeds.

Advantages

- May be used over one axis of rotation (monocentric knees) or multiple axes (polycentric knees).
- Accurately mimics anatomical knee function.
- Provides better swing control and stability than constant friction or pneumatic systems.
- Generally lighter and less expensive than microprocessor knees.

- Allows more variation walking speeds than pneumatic units due to the fine control afforded by the valves.

Disadvantages

- Piston seals are prone to wear.
- Can produce heat when actively worked for long periods.
- Heavier and more expensive than mechanical friction knees.
- Require more accuracy when being adjusted.
- More expensive than pneumatic or mechanical friction systems.
- Complex.