



SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution

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DEPARTMENT OF AGRICULTURE ENGINEERING

19AGB301-FARM TRACTORS

III YEAR V SEM

Topic : STEERING MECHANISM AND ITS TYPES.



STEERING MECHANISM

The steering system serves to change the direction of movement of the tractor by turning its front wheel (in wheel tractors) or varying the speed of one of the tractor (in crawler tractors)

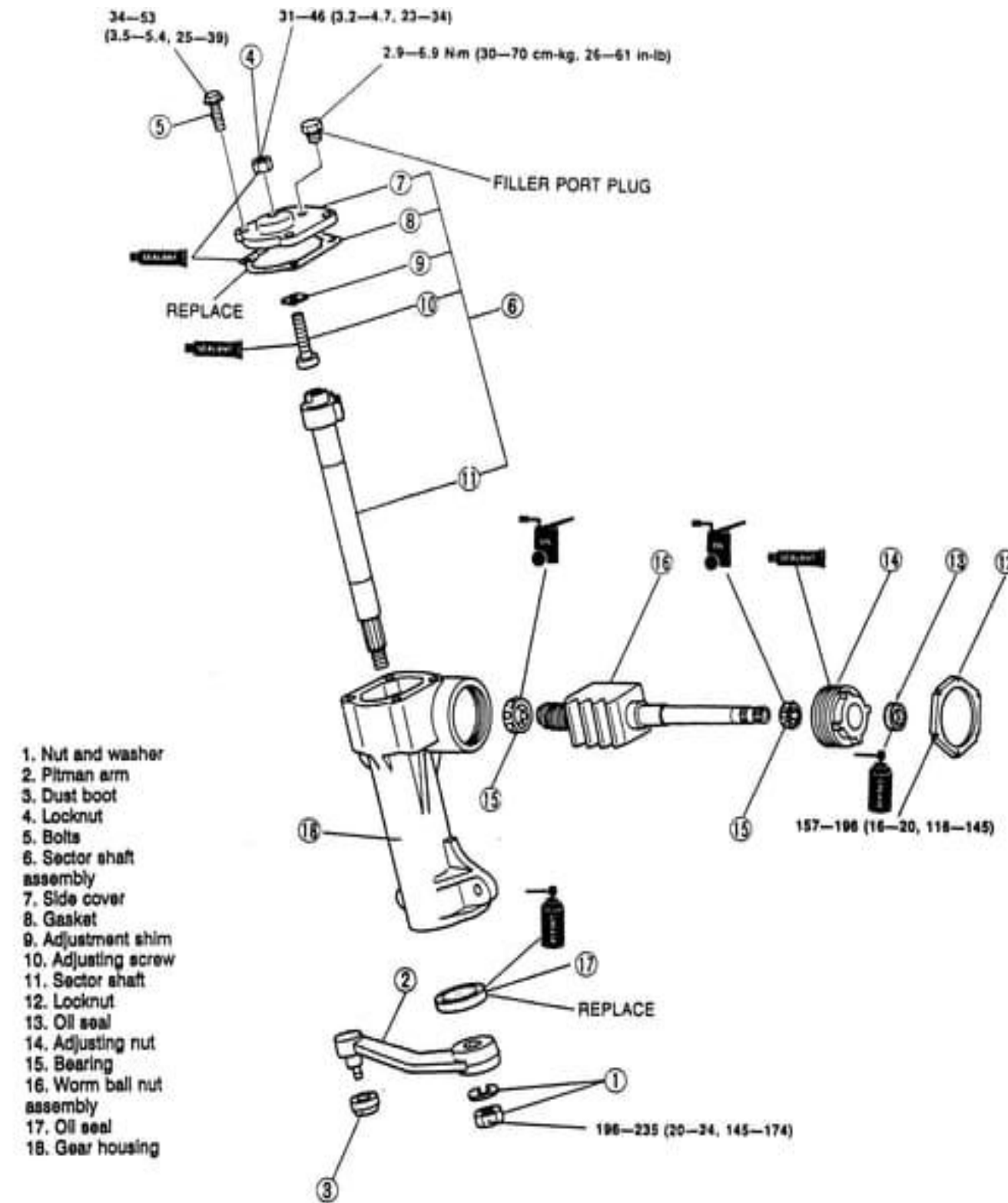


MANUAL STEERING

A manual steering rack uses a rack and pinion to turn the rotational movement of the steering wheel into the back-and-forth movement required to turn the wheels. The pinion is a round gear connected to the steering column; the pinion engages the rack, which is a flat bar with gear teeth cut into the top.



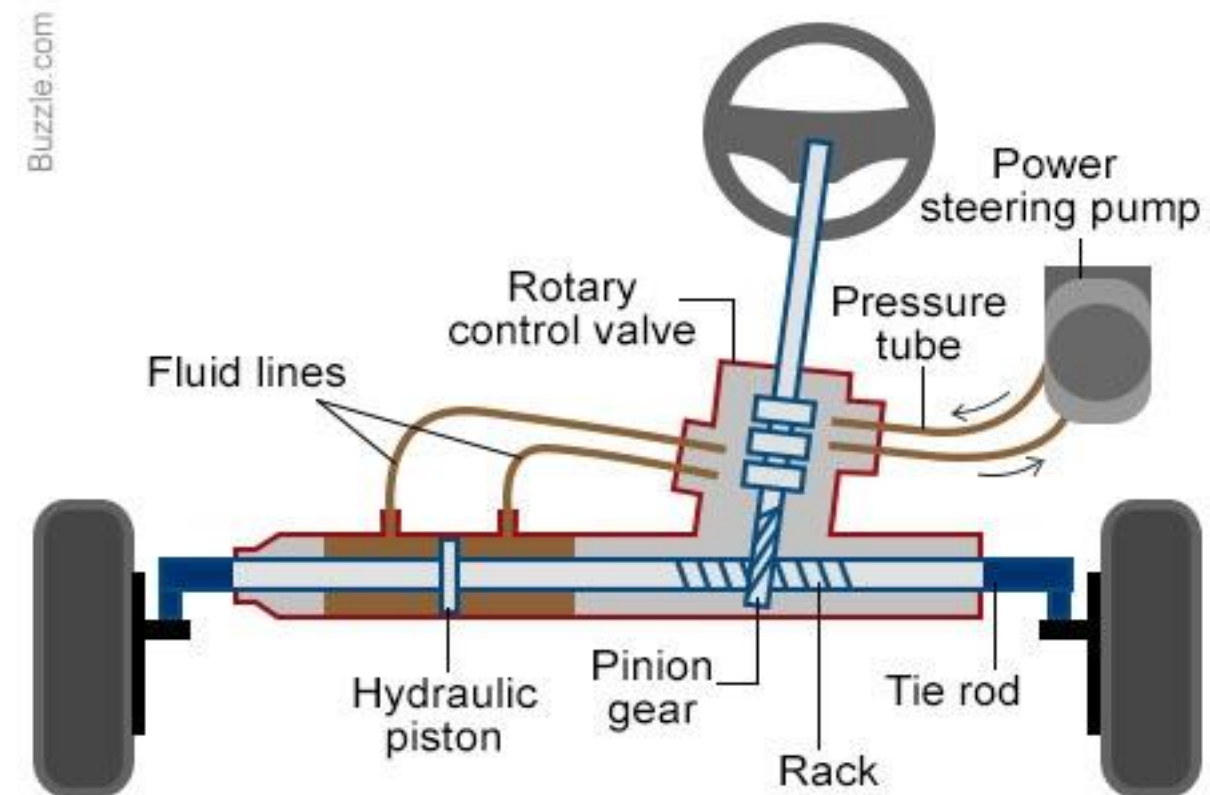
MANUAL STEERING





POWER STEERING

Use hydraulic pressure to move double acting cylinder.





Tracked Vehicle Steering

In order to steer a tracked vehicle, it is necessary to drive one track faster than the other, causing the vehicle to turn toward the slower track. This is called “skid steering” or “differential steering”. While the theory is simple, its execution is not.

Design Considerations

A steering transmission must, in addition to steering the vehicle, be easy to use. Most fast track-layers are tanks: incredibly heavy, powerful, and expensive machines that are operated by teenage recruits with limited experience, at night without lights, over rough and unfamiliar ground, with extremely limited vision... not to mention under fire.

Thus, whatever steering mechanism is used, it has to be fairly simple to operate.

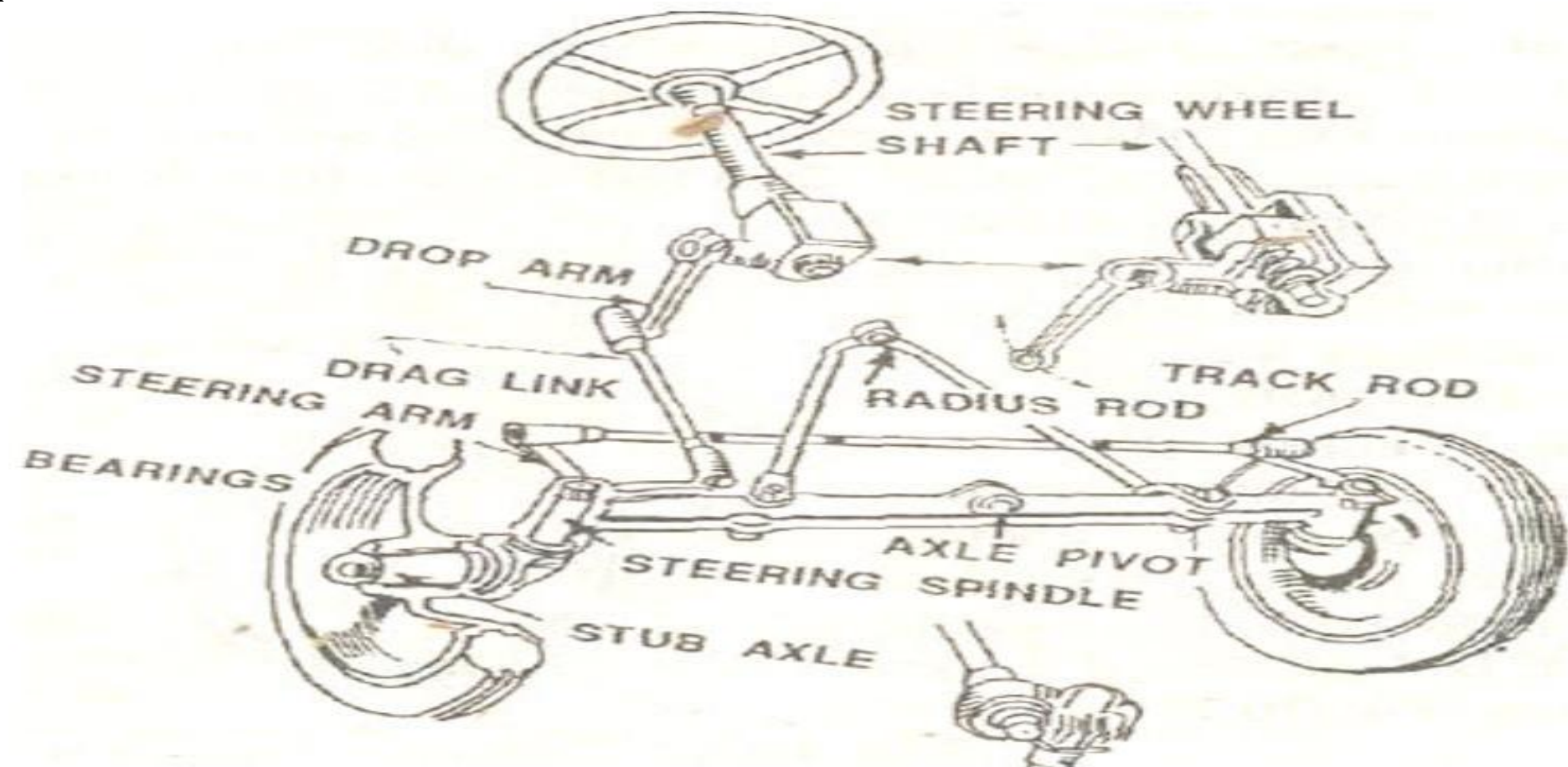


STEERING MECHANISM

The steering system can be classified into front wheel steering, rear wheel steering or all wheel steering.

The system, governing the angular movement of front wheels of a tractor is called steering system. This system steering wheel minimizes the efforts of the operator in turning the front wheel with the application of leverages. The different components of the system are:

- steering wheel
- steering shaft
- steering gear
- pitman arm (drop arm)
- drag link
- steering arm
- tie rod and
- king pin.

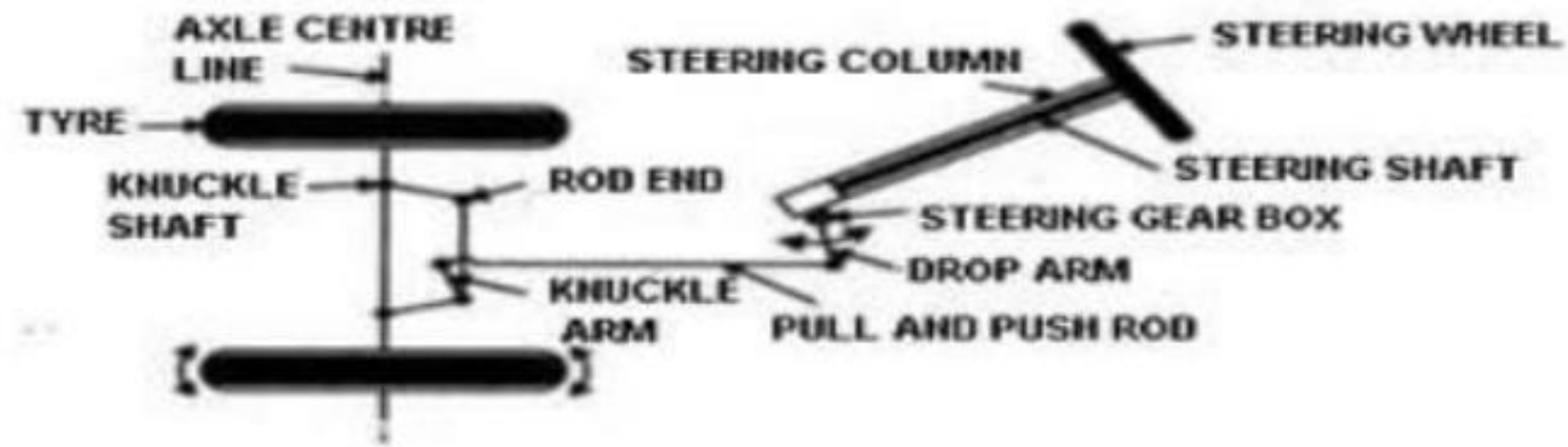
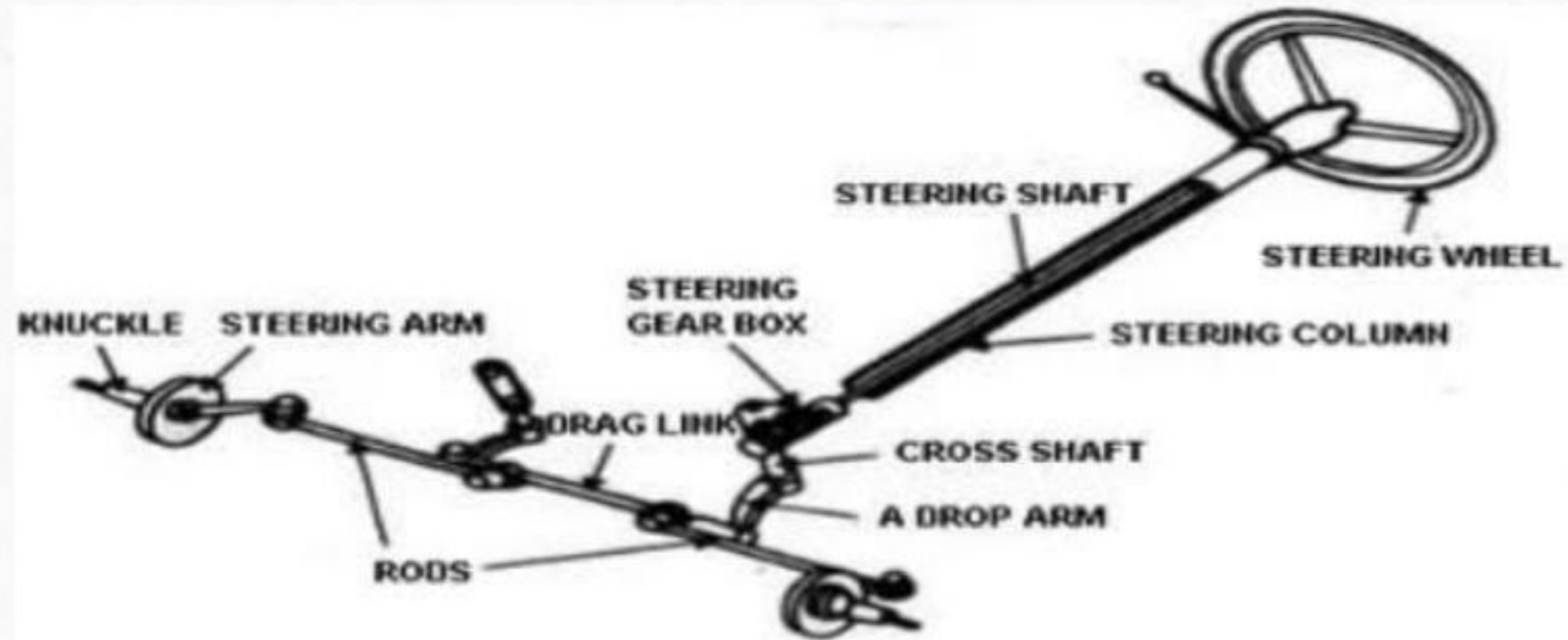


Steering system



STEERING MECHANISM

When the operator turns the steering wheel, the motion is transmitted through the steering shaft to tire angular motion of the pitman arm, through a set of gears. The angular movement of the pitman arm is further transmitted to the steering arm through the drag link and tie rods. Steering arms are keyed to the respective king pins which are integral part of the stub axle on which wheels are mounted. The movement of the steering arm affects the angular movement of the front wheel. In another design, instead of one pitman arm and drag link, two pitman arms and drag links are used and the use of tie rod is avoided to connect both steering arms.



LAYOUT OF STEERING SYSTEM



THE STEERING MECHANISM

Clutch-Brake Steering

Far less complicated (as it only requires one engine) is the Clutch-Brake system, where the output of a single power source drives both tracks directly.

Since they are physically connected to each other, the tracks must turn at the same speed and the vehicle will travel in a straight line.

To allow for turns, each track can be disconnected from the engine with a clutch, allowing that track to slow and the vehicle to turn fairly gently... a “free turn“.

A brake allows the disengaged track to be slowed to tighten the turn, even to the point of stopping the track so the vehicle turns in a very tight radius ... a “braked turn“.



TYPES OF STREEING.

Two types of steering systems are widely used in tractor

- 1.conventional steering
- 2.rack-and-pinion steering.



REFERENCE LINK

1. <https://youtu.be/tJ1VGQHRpkE>
2. <https://youtu.be/ltufRS3xj30>
3. https://youtu.be/svFm1m_R7H8
4. <https://youtube.com/watch?v=RM7GJrCPArE&feature=share>



Thank You