



SNS COLLEGE OF TECHNOLOGY

**Coimbatore-35
An Autonomous Institution**

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A+' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF AGRICULTURE ENGINEERING

19AGB301-FARM TRACTORS

III YEAR V SEM

Topic: Study of transmission system-assembly of gearbox, differential and final drive





Differential and final drive mechanism:

Differential divides the torque equally output wheels. Differential gear the power to wheels which is/are loaded with least resistance. This allows wheels to run at different speeds in a turn with least resistance.

Differential unit is a special arrangement of gears to permit one of the rear wheels of the tractor to rotate slower or faster than the other.

While turning the tractor on a curved path, the inner wheel has to travel lesser the tractor to move faster than the other at the turning point



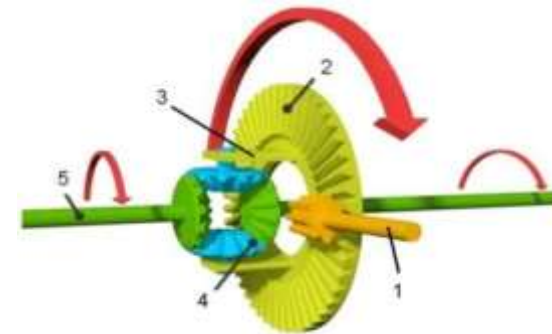
FINAL DRIVE

The pressure plate rings have the side gear, pinion, and the pinion gear locked inside, and behind each pressure rings are a number of clutch plates. When torque is applied to the differential, the differential case will spin and throw the pinion into the pressure ring cam. The pressure ring is then pushed out against the clutch plates thereby squeezing them together.



The main components of the differential are:

1. Input pinion gear
2. Crown wheel gear
3. Differential cage
4. Differential star
5. Differential axle (sun) gear





Working of an final drive:

- **Final drive is a gear reduction unit in the power trains between the differential and the drive wheels.**
- **Final drive transmits the power finally to the rear axle and the wheels.**
- **The tractor rear wheels are not directly attached to the half shafts but the drive is taken through a pair of spur gears**



- Each half shaft terminates in a small gear, which meshes with a large gear called bull gear.
- The bull gear is mounted on the shaft, carrying the tractor rear wheel.
- The device for final speed reduction, suitable for tractor rear wheels is known as final drive mechanism.



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Main functions of differential



Further reduces the rotations coming from the gear box before the same are passed on to the rear axles.

- Changes the direction of axis of rotation of the power by 90 degree i.e. from being longitudinal to transverse direction.
- To distribute power equally to both the rear driving axles when the tractor is moving in straight ahead direction
- To distribute the power as per requirement to the driving axles during turning i.e., more rotations are required by the outer wheel as compared to the inner wheel during turns





REFERENCES

• <https://youtu.be/nC6fsNXdcMQ>

<https://youtu.be/BaMTWP370vw>

• https://link.springer.com/chapter/10.1007/978-1-4020-8676-2_13



Thank You