

Agricultural Machinery

Practical

2nd Stage

Lecturers:

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Lecture 2

Farm Tractor

Tractors are important tools for farmers. The tractor is mainly used to plough fields or pull loads. A wide array of equipment makes the tractor multiuse agricultural equipment that can do many roles.

Tractor is a self-propelled power unit used as a prime mover for active tools and stationary farm machinery through power take-off shaft (PTO) or belt pulley.

The word **TRACTOR** was derived from 2 words (**TRC** which mean Traction and **TOR** which mean Motor)



Function of tractors

1. Lifting the agricultural machinery mounted and semi mounted by 3 Hitch points

Semi mounted



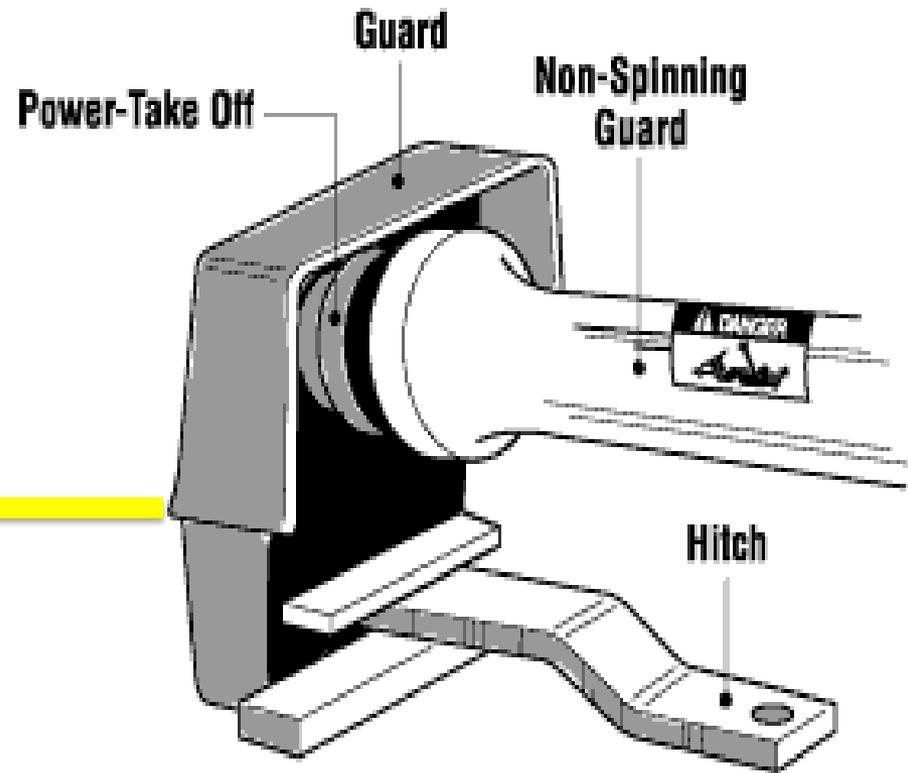
Mounted



2. Withdraw agricultural machinery and farm trailers.



3. Provide the ability rotary agricultural machinery necessary for their operations by **Power Take Off (P.T.O Shaft)**.



Power-Take Off Unit with Guards

Classification of tractors

a. According to structural design:

1. Wheel tractor

Tractors having three or four pneumatic wheels are called wheel tractors. Four wheel tractors are popular everywhere



2. Crawler tractor

This type is also called Track type tractor or Chain type tractor. In such tractors , there is endless chain or track in place of pneumatic wheels.



3. Walking tractor

Walking tractor is a power tiller. This tractor is usually fitted with two wheels only. The direction of travel and its controls for field operation is performed by the operator, walking behind the tractor.



b. According to purpose.

1. Standard / Utility Tractor

is general purpose machine and is designed for ploughing and driving any other equipment through its drive and is considered good for such farms where farmer cannot afford more machines to perform specific jobs and their capacity HP 30 -300, and throat clearance (the distance between a point of the lows and the ground) to cm 25 - 35 and operation speed 9 - 15km / h.



2. Row crop Tractor

This is an all round machine and is designed in such a way that it meets all the Agricultural demands like Ploughing, Harrowing, Levelling, Pulling Seed Drills, Weed Control, running different machines like Water Pumps, Threshers using belt pulley.

- their ability HP 30 -100
- throat clearance 80-60 cm
- Low wheels width.
- The possibility to modify the distance between the wheels spin-off.
- High throat clearance.



3. Orchard Tractor

- Used for the necessary work between trees and with capacity between 15 – 60 HP.
- Characterized by the following:
 - -The small size
 - Tractor generally low, especially the driver's seat so as not to collide subsidiaries of trees.
 - The smallest possible number of distinct parts in order to avoid engagement, subsidiaries of trees.



4. Garden Tractor •

Are the smallest types of tractors and their range of 5 – 15 HP is designed primarily to perform agricultural operations light in small spaces.

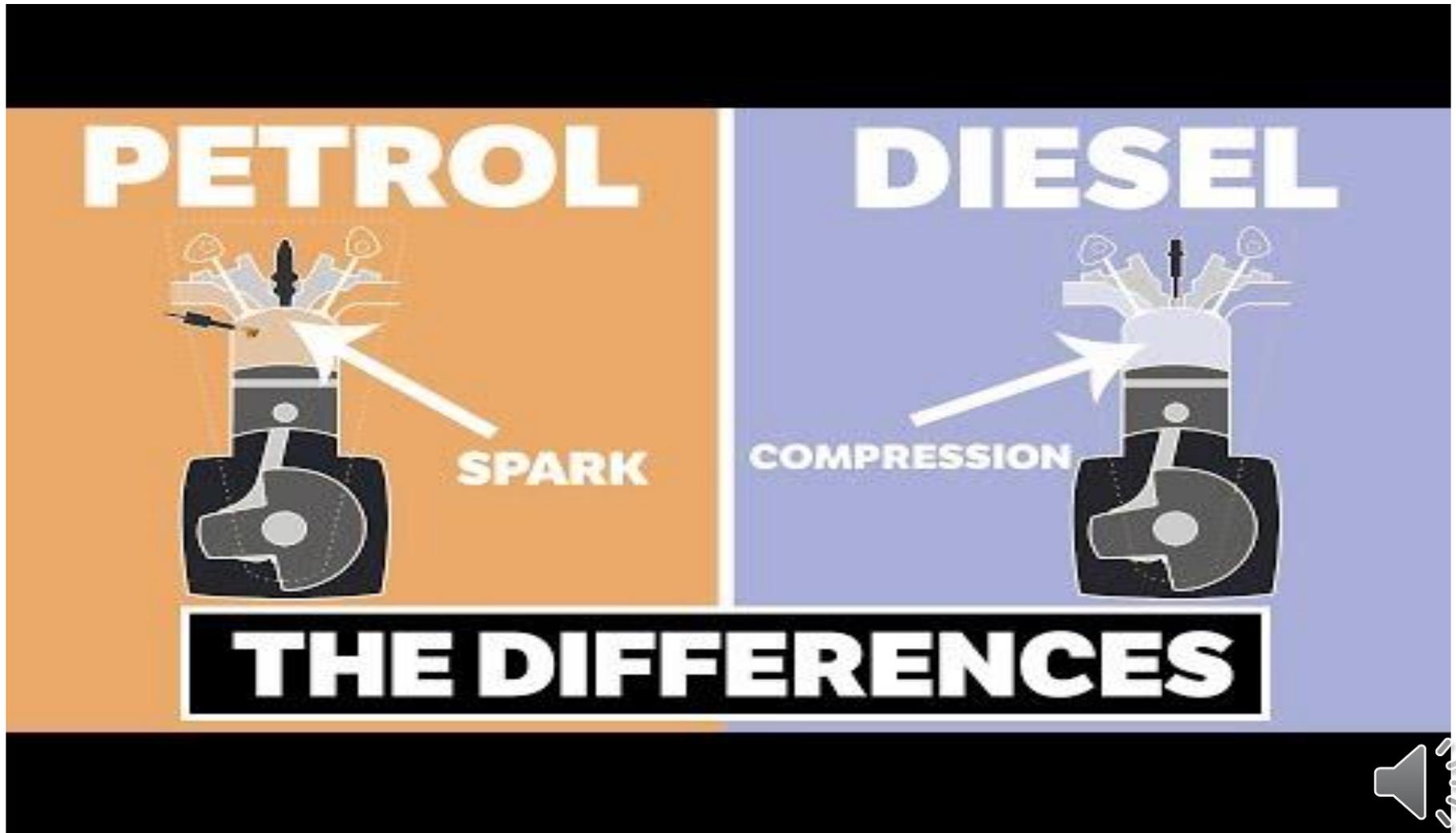
5. Transport Tractor

Used for the relocation work on dirt roads and trails, so equipped with wheels bear the difficulties of the road.



c. According to type of engine.

- Tractors spark ignition engines (Petrol engines).
- Tractors clicking ignition engines (Diesel engines).



Selection of tractor

Selection of tractors depend up on following factors:

Land holding:

Under a single cropping pattern, it is normally recommended to consider 1 hp for every 2 hectare of land. In other words , one tractor 20-25 hp is suitable for 40 hectare farm.

Cropping pattern:

Generally 1.5 hectare/hp has been recommended where adequate irrigation facility are available and more than one crop is taken. So a 30-35 hp tractor is suitable for 40 hectare of land.



Soil condition:

A tractor with less wheel base, higher ground clearance and low overall weight may work successfully in lighter soils but will not be able to give sufficient depth in black cotton soils.

Climatic condition:

For very hot zone and desert area, air cooled engines are preferred over water cooled engines. Similarly for higher altitude air cooled engines are preferred because water cooled engines are liable to be frozen at high altitudes.



Repair facilities:

It should be ensured that the tractor to be purchased has a dealer at near by place with all the technical skills for repair and maintenance of the machine.

Running cost:

Tractors with less specific fuel consumption should be preferred over others so that the running cost may be less.

Initial cost and resale value:

While keeping the resale value in mind , the initial cost should not be very high, otherwise higher amount of interest have to be paid.

